

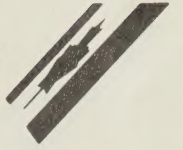
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## *Fiscal and Monetary Policy*

*This is Volume 21 in the series of studies commissioned as part of the research program of the Royal Commission on the Economic Union and Development Prospects for Canada.*

*The studies contained in this volume reflect the views of their authors and do not imply endorsement by the Chairman or Commissioners.*



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# Fiscal and Monetary Policy

JOHN SARGENT

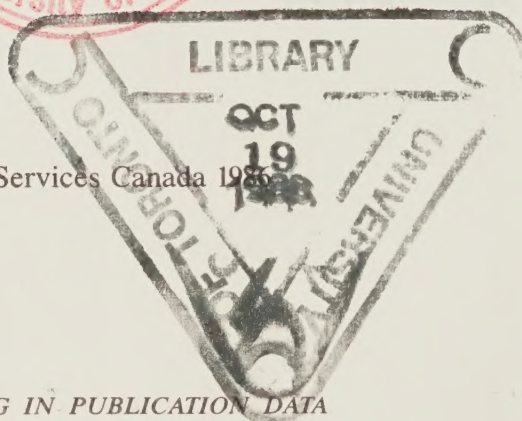
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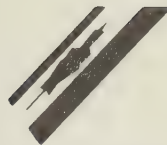
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When the members of the Rowell-Sirois Commission began their collective task in 1937, very little was known about the evolution of the Canadian economy. What was known, moreover, had not been extensively analyzed by the slender cadre of social scientists of the day.

When we set out upon our task nearly 50 years later, we enjoyed a substantial advantage over our predecessors; we had a wealth of information. We inherited the work of scholars at universities across Canada and we had the benefit of the work of experts from private research institutes and publicly sponsored organizations such as the Ontario Economic Council and the Economic Council of Canada. Although there were still important gaps, our problem was not a shortage of information; it was to interrelate and integrate — to synthesize — the results of much of the information we already had.

The mandate of this Commission is unusually broad. It encompasses many of the fundamental policy issues expected to confront the people of Canada and their governments for the next several decades. The nature of the mandate also identified, in advance, the subject matter for much of the research and suggested the scope of enquiry and the need for vigorous efforts to interrelate and integrate the research disciplines. The resulting research program, therefore, is particularly noteworthy in three respects: along with original research studies, it includes survey papers which synthesize work already done in specialized fields; it avoids duplication of work which, in the judgment of the Canadian research community, has already been well done; and, considered as a whole, it is the most thorough examination of the Canadian economic, political and legal systems ever undertaken by an independent agency.

The Commission's research program was carried out under the joint

direction of three prominent and highly respected Canadian scholars: Dr. Ivan Bernier (*Law and Constitutional Issues*), Dr. Alan Cairns (*Politics and Institutions of Government*) and Dr. David C. Smith (*Economics*).

Dr. Ivan Bernier is Dean of the Faculty of Law at Laval University. Dr. Alan Cairns is former Head of the Department of Political Science at the University of British Columbia and, prior to joining the Commission, was William Lyon Mackenzie King Visiting Professor of Canadian Studies at Harvard University. Dr. David C. Smith, former Head of the Department of Economics at Queen's University in Kingston, is now Principal of that University. When Dr. Smith assumed his new responsibilities at Queen's in September 1984, he was succeeded by Dr. Kenneth Norrie of the University of Alberta and John Sargent of the federal Department of Finance, who together acted as Co-directors of Research for the concluding phase of the Economics research program.

I am confident that the efforts of the Research Directors, research coordinators and authors whose work appears in this and other volumes, have provided the community of Canadian scholars and policy makers with a series of publications that will continue to be of value for many years to come. And I hope that the value of the research program to Canadian scholarship will be enhanced by the fact that Commission research is being made available to interested readers in both English and French.

I extend my personal thanks, and that of my fellow Commissioners, to the Research Directors and those immediately associated with them in the Commission's research program. I also want to thank the members of the many research advisory groups whose counsel contributed so substantially to this undertaking.

DONALD S. MACDONALD



At its most general level, the Royal Commission's research program has examined how the Canadian political economy can better adapt to change. As a basis of enquiry, this question reflects our belief that the future will always take us partly by surprise. Our political, legal and economic institutions should therefore be flexible enough to accommodate surprises and yet solid enough to ensure that they help us meet our future goals. This theme of an adaptive political economy led us to explore the interdependencies between political, legal and economic systems and drew our research efforts in an interdisciplinary direction.

The sheer magnitude of the research output (more than 280 separate studies in 70+ volumes) as well as its disciplinary and ideological diversity have, however, made complete integration impossible and, we have concluded, undesirable. The research output as a whole brings varying perspectives and methodologies to the study of common problems and we therefore urge readers to look beyond their particular field of interest and to explore topics across disciplines.

The three research areas, — *Law and Constitutional Issues*, under Ivan Bernier; *Politics and Institutions of Government*, under Alan Cairns; and *Economics*, under David C. Smith (co-directed with Kenneth Norrie and John Sargent for the concluding phase of the research program) — were further divided into 19 sections headed by research coordinators.

The area *Law and Constitutional Issues* has been organized into five major sections headed by the research coordinators identified below.

- Law, Society and the Economy — *Ivan Bernier and Andrée Lajoie*
- The International Legal Environment — *John J. Quinn*
- The Canadian Economic Union — *Mark Krasnick*

- Harmonization of Laws in Canada — *Ronald C.C. Cuming*
- Institutional and Constitutional Arrangements — *Clare F. Beckton and A. Wayne MacKay*

Since law in its numerous manifestations is the most fundamental means of implementing state policy, it was necessary to investigate how and when law could be mobilized most effectively to address the problems raised by the Commission's mandate. Adopting a broad perspective, researchers examined Canada's legal system from the standpoint of how law evolves as a result of social, economic and political changes and how, in turn, law brings about changes in our social, economic and political conduct.

Within *Politics and Institutions of Government*, research has been organized into seven major sections.

- Canada and the International Political Economy — *Denis Stairs and Gilbert Winham*
- State and Society in the Modern Era — *Keith Banting*
- Constitutionalism, Citizenship and Society — *Alan Cairns and Cynthia Williams*
- The Politics of Canadian Federalism — *Richard Simeon*
- Representative Institutions — *Peter Aucoin*
- The Politics of Economic Policy — *G. Bruce Doern*
- Industrial Policy — *André Blais*

This area examines a number of developments which have led Canadians to question their ability to govern themselves wisely and effectively. Many of these developments are not unique to Canada and a number of comparative studies canvass and assess how others have coped with similar problems. Within the context of the Canadian heritage of parliamentary government, federalism, a mixed economy, and a bilingual and multicultural society, the research also explores ways of rearranging the relationships of power and influence among institutions to restore and enhance the fundamental democratic principles of representativeness, responsiveness and accountability.

*Economics* research was organized into seven major sections.

- Macroeconomics — *John Sargent*
- Federalism and the Economic Union — *Kenneth Norrie*
- Industrial Structure — *Donald G. McFetridge*
- International Trade — *John Whalley*
- Income Distribution and Economic Security — *François Vaillancourt*
- Labour Markets and Labour Relations — *Craig Riddell*
- Economic Ideas and Social Issues — *David Laidler*

Economics research examines the allocation of Canada's human and other resources, the ways in which institutions and policies affect this

allocation, and the distribution of the gains from their use. It also considers the nature of economic development, the forces that shape our regional and industrial structure, and our economic interdependence with other countries. The thrust of the research in economics is to increase our comprehension of what determines our economic potential and how instruments of economic policy may move us closer to our future goals.

One section from each of the three research areas — The Canadian Economic Union, The Politics of Canadian Federalism, and Federalism and the Economic Union — have been blended into one unified research effort. Consequently, the volumes on Federalism and the Economic Union as well as the volume on The North are the results of an interdisciplinary research effort.

We owe a special debt to the research coordinators. Not only did they organize, assemble and analyze the many research studies and combine their major findings in overviews, but they also made substantial contributions to the Final Report. We wish to thank them for their performance, often under heavy pressure.

Unfortunately, space does not permit us to thank all members of the Commission staff individually. However, we are particularly grateful to the Chairman, The Hon. Donald S. Macdonald; the Commission's Executive Director, J. Gerald Godsoe; and the Director of Policy, Alan Nymark, all of whom were closely involved with the Research Program and played key roles in the contribution of Research to the Final Report. We wish to express our appreciation to the Commission's Administrative Advisor, Harry Stewart, for his guidance and advice, and to the Director of Publishing, Ed Matheson, who managed the research publication process. A special thanks to Jamie Benidickson, Policy Coordinator and Special Assistant to the Chairman, who played a valuable liaison role between Research and the Chairman and Commissioners. We are also grateful to our office administrator, Donna Stebbing, and to our secretarial staff, Monique Carpentier, Barbara Cowtan, Tina DeLuca, Françoise Guilbault and Marilyn Sheldon.

Finally, a well deserved thank you to our closest assistants: Jacques J.M. Shore, *Law and Constitutional Issues*; Cynthia Williams and her successor Karen Jackson, *Politics and Institutions of Government*; and I. Lilla Connidis, *Economics*. We appreciate not only their individual contribution to each research area, but also their cooperative contribution to the research program and the Commission.

IVAN BERNIER  
ALAN CAIRNS  
DAVID C. SMITH





The Royal Commission's Macroeconomics Research Program was designed to shed light on the macroeconomic evolution of the Canadian economy over the postwar period and particularly over the last two decades, on current macro policy issues, and on overall prospects for the Canadian economy. The results of the research program have provided background for the Commission's Final Report. The individual studies that constituted the research program are contained in volumes 19 through 25 of the Economics Section of the Collected Research Studies of the Royal Commission.

Volume 21 considers short- and long-run aspects of monetary and fiscal policy.

"Fiscal Policy in Canada: 1963–84," by Professor Douglas D. Purvis and Ms Constance Smith of Queen's University, provides a chronology of fiscal policy action and the overall fiscal policy stance, particularly of the federal government. The paper contains a discussion of fiscal policy indicators and guidelines.

"Consequences of Government Budget Deficits," by Professors Neil Bruce and Douglas D. Purvis of Queen's University, examines short- and long-run consequences of government deficits and develops a proposed "guideline for prudent levels of the government deficit" that takes account of cyclical, inflationary and longer-run growth factors. In view of the importance and of the controversial nature of the subject examined by Professors Bruce and Purvis, two discussants were invited to comment on the paper when it was presented to the Macroeconomics Research Advisory Group. The discussants were Professor John Bossons of the University of Toronto, who devoted particular attention to the adjustments that should be taken into account in

measuring the extrapolatable level of the so-called “structural” deficit, and Dr. John Grant of Wood Gundy, Inc., who considered how the level of real interest rates should influence the choice of prudent levels of the deficit. Versions of their comments are included in this volume following the Bruce and Purvis paper.

“The Theory and Practice of Monetary Policy in Canada: 1945–83,” by Professor Gordon R. Sparks of Queen’s University, provides a chronology of monetary policy in the context of economic developments in Canada and relates policy to contemporaneous developments in monetary thought.

“Regional Stabilization in Canada,” by Professor Yves Rabeau of the University of Montreal, reviews regional aspects of cyclical performance in Canada, and analyzes possible macroeconomic policy approaches to the issue of regional stabilization, on the part of the federal and provincial governments.

“Monetary Control in Canada,” by Professors Jean-Marie Dufour and Daniel Racette of the University of Montreal, reviews recent theoretical analysis and econometric studies relevant to the broad issues of choice of a general monetary policy approach, and to the issues of choice of target variables and of instrument or control variables.

“The Government Budget, the Accumulation of Capital, and Long-run Welfare,” by Professor Robin W. Boadway and Mr. W. Steven Clark of Queen’s University, surveys recent developments in the theoretical analysis of the longer-run impacts on capital formation and economic welfare of the government budget balance, the tax structure, and the funding of social security systems.

“Keynesian Theories of Accumulation and Their Policy Implications: A Critical Review,” by Professor A. Asimakopulos of McGill University, examines aspects of Keynes’, Harrod’s, and Robinson’s theoretical frameworks that are relevant to capital accumulation and growth, and studies the role of fiscal policy in such theories.

Together, the papers in the volume reflect the divergence in views which characterizes economic thinking as to the degree of activism that governments should exercise in the conduct of monetary and fiscal policy, and as to the nature of guidelines that should shape policy.

JOHN SARGENT



The Commission's Macroeconomics Research Studies Program benefited from the advice and assistance of a great many individuals.

David C. Smith, Research Director of the overall Economics Research Program, had a major role in conceiving the broad outlines of the Macroeconomics Program, and provided invaluable advice throughout.

The members of the Macroeconomics Research Advisory Group gave generously of their time and their expertise; their advice made a major contribution to the design of the program, to the development of terms of reference for the individual studies, and to the review of early drafts of the studies. The Research Advisory Group members were John Crow, Senior Deputy Governor, Bank of Canada, Ottawa; Wendy Dobson, Executive Director, C.D. Howe Institute, Toronto; Pierre Fortin, Professor of Economics, Laval University, Quebec; Charles Freedman, Adviser, Bank of Canada, Ottawa; John Grant, Vice-President and Chief Economist, Wood Gundy, Inc., Toronto; John Helliwell, Professor of Economics, University of British Columbia, Vancouver; David Laidler, Professor of Economics, University of Western Ontario, London, Ont.; Paul-Henri Lapointe, Director, Special Projects and Policy Analysis Division, Department of Finance, Ottawa; John McCallum, Professor of Economics, University of Quebec at Montreal; Sylvia Ostry, Ambassador for Multilateral Trade Negotiations, Department of External Affairs, Ottawa; Ross Preston, Senior Project Director, Economic Council of Canada, Ottawa; Douglas Purvis, Professor of Economics, Queen's University, Kingston; Brian Scarfe, Professor of Economics, University of Alberta, Edmonton; Alasdair Sinclair, Vice-President (Academic), Dalhousie Univer-

sity, Halifax; David Slater, Chairman, Economic Council of Canada, Ottawa; Gordon Sparks, Professor of Economics, Queen's University, Kingston; William White, Adviser, Bank of Canada, Ottawa; and Thomas Wilson, Professor of Economics, University of Toronto.

Commissioner Clarence L. Barber provided valuable comments on a number of the individual studies.

Craig Riddell who, in addition to his responsibilities as Research Coordinator of the Labour Markets and Relations Section of the Economics Research Program, attended several meetings of the Macroeconomics Research Advisory Group and contributed significantly to the overall Macroeconomics Program.

The referees of the individual studies, who were mainly drawn from the Canadian academic community and some of whom were also members of the Research Advisory Group, in all cases made best efforts to assess the studies against the unique requirements of a Royal Commission research program and provided useful suggestions and comments on the individual studies.

The highly competent and energetic assistance of Barbara Cowtan, secretary, and of researchers Judith Gold and Douglas Green was of immense help. The efforts of Lilla Connidis — the Assistant Director, Economics Research — and Tina DeLuca, Marilyn Sheldon, and Donna Stebbing of the secretarial staff were also essential to the administration and processing associated with individual studies, and to the organization of symposia and of Research Advisory Group meetings.

Lastly, the authors of the individual studies contributed not only through the quality of their individual work but through doing their best to shape the coverage of their studies to the suggested specifications — which were always provided but often less than pellucid — to meet deadlines that were tight, and to respond to the multiple and not always consistent suggestions of referees, RAG members, copy editors, and the coordinator.

All the above deserve much credit for whatever of value may have been produced in the course of the Macroeconomics Research Program, but responsibility for any gaps in the program, and for failures to explore particular approaches to the individual topics considered, properly rests with the coordinator.

J.H.S.



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# Fiscal Policy in Canada: 1963–84

DOUGLAS D. PURVIS  
CONSTANCE SMITH

## Introduction

This study takes as its basic premise that, although monetary policy in Canada during the post-second World War period has been extensively documented and analyzed, the broad strategies and outcomes of fiscal policy are not as well documented or understood. As a result, a large part of the study is descriptive, building a chronological history of recent fiscal policy. Emphasis throughout is on the stabilization aspects of federal budgetary policy.

In addition, a theoretical framework — essential for organizational purposes — is laid out, in which we outline the modern theory of fiscal policy, albeit rather briefly as thorough expositions are available elsewhere. Emphasis is given to key features of the Canadian economy since the Second World War — including federal-provincial fiscal relations, the open economy setting, and distortions introduced by inflation into the conventional accounting relationships.

We then turn to a detailed, episodic history of the role of fiscal policy by evaluating federal budgets on an individual basis, beginning in 1962. This data was chosen to provide a link to the study of fiscal policy over the 1945–63 period by Robert Will (1967), prepared for the Royal Commission on Taxation which reported in 1966.

The basic time unit of our study is the business cycle: for each cyclical phase we discuss the economic environment in terms of the evolution of inflation and unemployment, the international setting, and the actual and expected stances of the provincial governments. Then for each budget during the cycle we describe briefly and evaluate the fiscal actions taken.

Finally, we attempt to draw some lessons from looking at the history in a longer run “dynamic” sense rather than just “budget-by-budget.” We discuss the potential for cumulative error and/or destabilizing policy reversals, interaction with other policy objectives, the efficacy of alternative fiscal tools, the changing role of automatic stabilizers, the changing structure of spending and taxes and the implications for micro-economic disincentives, and the monetary policy — fiscal policy mix.

## **A Framework for Analyzing Fiscal Policy**

The government’s fiscal operations involve a massive array of purchases of goods and services, transfer payments, subsidies, and tax receipts. The characteristics of the various items in this array differ greatly. Some are the result of permanent programs, while others are inherently of a one-shot variety; some automatically vary in magnitude with the state of the economy, while others vary only in response to discretionary policy changes; some are focussed by region or sector, while others are evenly distributed throughout the country, and some involve the foreign sector directly, while others do not. These differences are important, but to study the government’s fiscal operations on an item-by-item basis would not only be totally impractical but would also risk “missing the forest for the trees.”

Macroeconomists interested in the stabilization role of the government’s fiscal actions have traditionally focussed on one summary statistic — the budget deficit, which is the excess of government expenditure over tax revenue expressed in dollars per year. As we shall see, however, a number of problems complicate efforts to measure the deficit in a manner appropriate for analyzing stabilization policy.<sup>1</sup>

### ***Measuring Fiscal Policy***

In this section we briefly address the issue of how to measure the deficit in order to analyze stabilization policy. Many of these issues are discussed in Blinder and Solow (1974); see also Parkin (1983) and Bruce and Purvis (1983a). The standard procedure is to adjust the deficit in two ways.<sup>2</sup>

One adjustment is cyclical, designed to take account of the impact of the state of the economy on the deficit through the operation of cyclically related expenditures and taxes. The cyclically adjusted deficit is that part of the deficit that represents the autonomous influence of the fiscal authorities. This adjustment is widely accepted as appropriate for measuring the stance of fiscal policy, but the actual procedures by which the adjustment is made are controversial. Table 1-1 presents the time series for the actual and cyclically adjusted federal deficit as calculated by the Department of Finance. Table 1-2 shows the same items as a share of Gross National Product (GNP).

**TABLE 1-1 Federal Budget Balance**

	Actual	Cyclical Adjust- ment	Millions of dollars Cyclically Adjusted (1) + (2) (3)	Inflation Adjust- ment (4)	Cyclically and Inflation Adjusted (3) + (4) (5)
	(1)	(2)	(3)	(4)	(5)
1960	-229	447	218		
1961	-410	650	240		
1962	-507	345	-162		
1963	-286	259	-27		
1964	345	3	348		
1965	544	-176	368		
1966	231	-446	-215		
1967	-84	-169	-253		
1968	-11	-147	-158		
1969	1,021	283	738		
1970	266	261	527	408	935
1971	-145	145	0	294	294
1972	-566	-99	-665	494	-171
1973	387	-977	-590	1,091	501
1974	1,109	-1,564	-455	1,354	899
1975	-3,805	-42	-3,847	909	-2,938
1976	-3,391	-669	-4,060	1,031	-3,029
1977	-7,303	491	-6,812	966	-5,846
1978	-10,686	819	-9,867	1,538	-8,329
1979	-9,264	360	-8,904	4,123	-4,781
1980	-10,153	1,962	-8,191	4,591	-3,600
1981	-7,979	1,788	-6,191	6,216	25
1982	-21,083	9,378	-11,705	6,718	-4,987
1983	-24,457	11,024	-13,433	3,301	-10,132

Sources: Department of Finance, *Economic Review 1983*, Reference Table 54, and *The Federal Deficit in Perspective* (April 1983), Table F-1.

Note: A minus sign indicates a deficit.

Two important limitations of the cyclical-adjustment procedure are worth emphasizing. First, the resulting adjusted deficit series is not a measure of autonomous fiscal influence, since non-cyclical events (e.g., exogenous changes in relative energy prices or real interest rates) may influence the adjusted deficit. Nevertheless, changes in the cyclically adjusted deficit are likely a fairly reliable indicator of changes in the fiscal stance. Second, the distinction between medium-term and long-term targets may be important, particularly for assessing the importance of cyclically adjusted deficits. This is emphasized in Bruce and Purvis (1983a, 1983b) and is implicitly the source of dispute between Parkin and Bossons in Conklin and Courchene (1983).

The second adjustment, also fairly widely accepted in principle, is to adjust the deficit for the effect of inflation on the value of the stock of nominal government liabilities outstanding. Inflation confers capital

**TABLE 1-2 Federal Budget Balance as a Share of GNP**

	Actual	Cyclical Adjust- ment	Percent Cyclically Adjusted (1) + (2)	Inflation Adjust- ment	Cyclically and Inflation Adjusted (3) + (4)
	(1)	(2)	(3)	(4)	(5)
1960	-.6	1.2	.6		
1961	-1.0	1.6	.6		
1962	-1.2	.8	-.4		
1963	-.6	.5	-.1		
1964	.7	0	.7		
1965	1.0	-.3	.7		
1966	.4	-.0	.7		
1967	-.1	-.3	-.4		
1968	0	-.2	-.2		
1969	1.3	-.4	.9		
1970	.3	.3	.6	.5	1.1
1971	-.2	.2	.0	.3	.3
1972	-.5	-.1	-.6	.4	-.2
1973	.3	-.8	-.5	.9	.4
1974	.8	-1.1	-.3	.8	.6
1975	-2.3	0	-2.3	.5	-1.8
1976	-1.8	-.4	-2.2	.6	-1.6
1977	-3.5	.3	-3.2	.6	-1.6
1978	-4.6	.3	-4.3	.7	-3.6
1979	-3.5	.1	-3.4	1.6	-1.8
1980	-3.5	.8	-2.7	1.5	-1.2
1981	-2.4	.6	-1.8	1.8	0
1982	-6.0	2.9	-3.1	1.7	-1.4
1983	-6.3	3.1	-3.2	.9	-2.3

Sources: Department of Finance, *Economic Review 1983*, Reference Table 54, and *The Federal Deficit in Perspective* (April 1983), Table F-1.

Note: A minus sign indicates a deficit.

gains on the government by reducing the real value of its financial liabilities, and inflicts a corresponding capital loss on the holders of those financial instruments. To the extent that inflation was expected, these capital gains and losses are offset by the inflation premium included in interest rates. In this view the inflation premium is just a prepayment of principal, since it corresponds exactly to the decline in the real value of the principal outstanding. In order to preserve their real asset position, private sector asset holders will have to save the entire inflation premium component of government interest payments. Accordingly, those payments will have virtually no effect on aggregate demand and must be netted out of the deficit in arriving at a measure of fiscal stimulus.<sup>3</sup>

In making the inflation adjustment, controversy surrounds both the measure of the stock of liabilities to apply the adjustment to and the rate of

inflation to use. For instance, distinctions between anticipated and unanticipated as well as between actual and target inflation might be important. Department of Finance calculations of the inflation adjustment, based on realized inflation rates, are presented in Tables 1-1 and 1-2.

These two adjustments give us the inflation and cyclically adjusted deficit shown in column 5 of Table 1-1 (millions of dollars) and Table 1-2 (as a percentage of GNP). Hereafter we refer to this as the *structural deficit*.<sup>4</sup>

The deficit, however adjusted, is only a summary statistic. Concentration on it will, on occasion, cause key changes in fiscal policy to escape unnoticed or be otherwise misunderstood. Emphasis on the various components of the deficit — income taxes, investment tax credits, transfer payments, real purchases — has changed, and we identify some major changes.

### *The Role of the Provinces*

One conceptual issue that must be addressed is the role of the provinces. Should their budget positions also be included in our measure of fiscal policy? In principle, of course, there is no reason to exclude them; their budget positions, dollar-for-dollar, exert roughly equivalent pressures on the economy. Further, their budget positions have exhibited substantial fluctuations and hence are historically an important element of fiscal policy. Tables 1-3 and 1-4 present the basic series, analogous to Tables 1-1 and 1-2, of deficits on a consolidated government basis.<sup>5</sup>

Provincial policies appear to have been pro-cyclical.<sup>6</sup> This need not undermine the effectiveness of fiscal stabilization on the part of the federal government since it could, in principle, just offset anything the provinces do. In practice, this seems not to be what happens; provincial budgets typically follow the federal budget and often react to it. Hence federal policy is formulated in the face of considerable uncertainty about what provincial policy will be. For example, in the debate leading up to the April 1983 federal budget, concern was expressed in several quarters that the provinces might go on a “revenue grab.” This suggests that institutional reform that encourages the federal government to “play last” or which otherwise constrains the ability of the provinces to react to and undo the effects of federal policy may be worth exploring. (For further discussion, see Brander, 1985.)

The Royal Commission on Taxation (vol. 2, p. 102) argued that the provinces should refrain from involvement in active stabilization policies because, unless each province took into account the actions of the others, the results could be offsetting or poorly timed. Perhaps a more compelling argument against the provinces actively pursuing stabilization policies is that import and other leakages will reduce the impact of stabilization policies to such an extent as to make them futile.<sup>7</sup> Another

**TABLE 1-3 All Governments Budget Balance**

	Actual	Cyclical Adjust- ment	Millions of dollars Cyclically Adjusted (1) + (2) (3)	Inflation Adjust- ment (4)	Cyclically and Inflation Adjusted (3) + (4) (5)
	(1)	(2)	(3)	(4)	(5)
1960	-670	503	-167		
1961	-835	750	-85		
1962	-706	425	-281		
1963	-624	327	-297		
1964	99	9	108		
1965	207	-214	-7		
1966	425	-572	-147		
1967	148	-190	312		
1968	502	-190	312		
1969	1,915	-365	1,550		
1970	806	375	1,181	757	1,838
1971	130	187	317	532	849
1972	81	-172	-91	876	785
1973	1,252	-1,332	-80	1,931	1,851
1974	2,795	-2,023	722	2,376	3,148
1975	-4,049	8	-4,041	1,561	-2,480
1976	-3,222	-910	-4,132	1,756	-2,376
1977	-5,005	618	-4,387	1,516	-2,871
1978	-7,393	1,007	-6,386	2,148	-4,238
1979	-5,003	572	-4,431	4,940	509
1980	-6,175	3,040	-3,135	4,923	1,788
1981	-4,025	5,372	1,347	6,181	7,528
1982	-18,639	13,361	-5,278	6,352	1,074
1983	-22,749	15,263	-7,486	3,301	-4,185

Sources: Department of Finance, *Economic Review 1983*, Reference Table 54, and *The Federal Deficit in Perspective* (April 1983), Table F-1.

Note: A minus sign indicates a deficit.

form of “leakage” that is bothersome to provincial treasurers is that expansion leads to a relatively larger increase in federal government revenues compared with provincial revenues. To the extent that the provinces are faced with small fiscal multipliers, a shift towards stronger automatic stabilizers and a decreased reliance on discretionary stabilization is called for.

Adequate access to credit is also a greater problem for provincial governments than for the federal government. The Economic Council of Canada (1982, p. 85) and Barber (1966) have argued that the cost of borrowing is not a major deterrent to provincial acceptance of large deficits, but Auld (1982, p. 308) has claimed the contrary. A review of any provincial budget speech, especially during a period when a province expects to carry a larger-than-usual debt load, indicates that much importance is attached to minimizing borrowing costs by maintaining a

**TABLE 1-4 All Governments Budget Balance as a Share of GNP**

	Actual	Cyclical Adjust- ment	Percent Cyclically Adjusted (1) + (2)	Inflation Adjust- ment	Cyclically and Inflation Adjusted (3) + (4)
	(1)	(2)	(3)	(4)	(5)
1960	-1.8	1.4	-.4		
1961	-2.1	1.9	-.2		
1962	-1.6	1.0	-.6		
1963	-1.4	.8	-.6		
1964	.2	0.0	.2		
1965	.4	-.4	-.0		
1966	.7	-.9	-.2		
1967	.2	-.3	-.1		
1968	.7	-.3	.4		
1969	2.4	-.4	2.0		
1970	.9	.5	1.4	.9	2.3
1971	.1	.2	.3	.6	.9
1972	.1	-.2	-.1	.8	.7
1973	1.0	-1.1	-.1	1.6	1.5
1974	1.9	-1.4	.5	1.6	2.1
1975	-2.5	.1	-2.4	1.0	-1.2
1976	-1.7	-.5	-2.2	1.0	-1.2
1977	-2.4	.3	-2.1	.7	-1.4
1978	-3.2	.4	-2.8	1.0	-1.8
1979	-1.9	.2	-1.7	1.9	.2
1980	-2.1	1.1	-1.0	1.6	.6
1981	-1.2	1.6	.4	1.8	2.2
1982	-5.3	3.9	-1.4	1.7	.3
1983	-5.9	4.1	-1.8	.9	-.9

Sources: Department of Finance, *Economic Review 1983*, Reference Table 54, and *The Federal Deficit in Perspective* (April 1983), Table F-1.

Note: A minus sign indicates a deficit.

good credit standing. Standard and Poors' downgrading of Quebec and Nova Scotia bonds in 1982 and British Columbia bonds in 1983 indicates that borrowing costs are not unresponsive to the size of provincial debt.

In general it appears as though provincial governments face higher costs and lower benefits from counter-cyclical stabilization policies, especially discretionary policy. Therefore, they would be expected to be less quick to adopt such policies than would the federal government. Indeed, until the early 1970s provincial governments did not actively pursue stabilization policies.

During the 1960s a number of changes made active provincial stabilization policies appear more feasible. First, the size of combined provincial-local government budgets grew immensely. Spending by the provincial-local sector was 23.1 percent of GNP in 1970 compared with 13.2 percent in 1960. Second, personal and corporate income taxes

became an increasingly important revenue source. During the Second World War the provinces agreed to retire from the corporate and personal income tax fields in exchange for a variety of grants and subsidies; it was not until the 1960s that they regained a large share of the revenue generated by these sources. A third reason for more active provincial stabilization policies — one suggested by Wilson (1977) — is that it has become a political necessity. With larger budgets provincial governments have become more visible and, perhaps, have felt a greater responsibility for macroeconomic problems.

Here, however, we focus on the budget position of the federal government. This is primarily because it is the decision-making process and policy stance of the federal government that is at the heart of stabilization policy. Nevertheless, we recognize major policy initiatives taken by the provinces. We also note the “technical” links between policy at the two levels of government, through the personal and corporate income taxes, and through federal-provincial transfer programs such as the Established Programs Financing Arrangement and equalization payments.

### *Evaluating Fiscal Policy*

Although no formal model is laid out here, we implicitly use an eclectic macroeconomic model in which monetary and fiscal policy are effective in influencing aggregate demand, and in which aggregate demand can influence both prices and output in the short run but primarily the price level in the long run. (That is, the model obeys the natural rate hypothesis.) Further, emphasis is given to the role of expectations in determining the division between output and prices of the short-run response to aggregate demand shocks and the speed by which the economy approaches the long-run equilibrium. (This is formally described as the expectations-adjusted Phillips curve.) Given this, fiscal policy is implicitly evaluated in terms of a loss function that attaches costs to deviations in output from the full employment level and to inflation.<sup>8</sup>

A key factor influencing the operation and effectiveness of fiscal policy is the openness of the Canadian economy and the exchange rate regime. A standard proposition that arises in the conventional and widely used Mundell-Fleming model is that fiscal policy is impotent under flexible exchange rates. In this view fiscal expansion leads to a real appreciation, which causes net exports to fall by an amount that just offsets the stimulative effect of the fiscal expansion. This result comes from a model in which the domestic price level is given and domestic interest rates are tied to those prevailing in the rest of the world. Thus there is a one-to-one relationship, arising from the condition for money market equilibrium, between the domestic money supply and real output; that is, monetary policy is effective but fiscal policy is not.

This result is not robust, for a number of reasons. First, the appreciation is likely to lead to some domestic deflation; the growth in real

balances will thus “create room” for growth in output. Second, once exchange rate expectations are allowed for, in the short run the domestic interest rate is not rigidly tied to the foreign interest rate, so some room for a standard fiscal policy effect — higher  $y$  and higher  $i$  — is possible.<sup>9</sup> Third, it ignores the long-run effect of cumulative foreign borrowing on the debt-service component of the current account.

Thus theory suggests a role for fiscal policy even under flexible exchange rates. This role is reinforced when the monetary authorities act to “manage” the exchange rate, since fiscal policy can be effective in the Mundell-Fleming model if the exchange rate is prevented from floating freely. Hence, possible exchange rate and monetary policy responses to fiscal policy are important and will be considered below.

### *The Econometric Evidence*

There are a large number of econometric studies of fiscal policy in Canada in the postwar period. These include studies done using the several available “large econometric models” and a number of studies using single-equation reduced form estimates. A thorough review of the literature is available in Helliwell (1982). As Table 1-5, reproduced from Helliwell, shows, there is a fairly wide range of estimates of the size of the fiscal policy multiplier under a flexible exchange rate with a fixed money supply. But all indicate some effect of fiscal stimulus on both output and inflation.

Most relevant for our purposes is the recent study by McCallum (1983), who employs the average of the multipliers as summarized by Helliwell to answer the question of whether fiscal policy has been a stabilizing factor. McCallum constructs a series for the structural deficit.<sup>10</sup> The first step in his analysis is then to correlate that series with his series for the output gap in the economy; he demonstrates that there is some tendency for changes in the structural deficit to be associated with opposite changes in output relative to capacity. The structural deficit rose from 1971 to 1972, then fell through 1974, and then rose during the 1974–75 downturn. The deficit flattened out in 1976 and then rose in 1977 and 1978 — a period characterized by rising unemployment and output gaps but which is also indicated as a cyclical expansion by Cross (1983). From 1979 through 1981 the structural deficit was shrinking, thus dampening the recovery and expansion phases of 1978–79 and 1980–81 but exacerbating the downturns of 1979–80 and 1981–82.

For the 1971–81 period, McCallum’s regression results indicate substantial counter-cyclical movement of federal structural deficits and slight pro-cyclical movements of provincial and municipal structural deficits. This, of course, does not give a complete answer to the question of whether fiscal policy is stabilizing, since it focusses on the stance of fiscal policy rather than the effects. To deal with this issue McCallum then “simulates” a fiscal rule, netting out the effects of discretionary

**TABLE 1-5 Effects of Fiscal Policy: 1982 Experiments Policy Change:  
A \$1 Billion Increase in Non-Wage Government Spending**

	Real Multipliers with Fixed M1 and Flexible Exchange Rates			Ratio of Average Inflation Effects to Average Real GNP
	Year 1	Year 2	Year 3	Effects Over 3 Years
RDXF	1.09	0.79	0.58	0.31
QFS	1.0	1.2	1.3	0.08
FOCUS <sup>a</sup>	1.37	1.70	1.74	0.22
DRI	1.44	1.56	1.23	0.49
TIM	1.67	1.72	—	−0.91
CANDIDE	1.98	2.26	2.24	0.08
CHASE	1.1	0.9	0.5	0.47
SAM	0.37	0.30	0.32	1.88
MACE	0.75	0.55	0.22	1.01
Mean	1.20	1.22	1.02	0.50
Standard Deviation	0.48	0.64	0.73	0.60

*Sources:* Reproduced from Helliwell (1982). Bank of Canada and Department of Finance. “Seminar on Responses of Various Models to Selected Policy Shocks” (Ottawa, 1982).

*Note:* Simulation Period 1982–84.

a. With a mark-up price rule in effect.

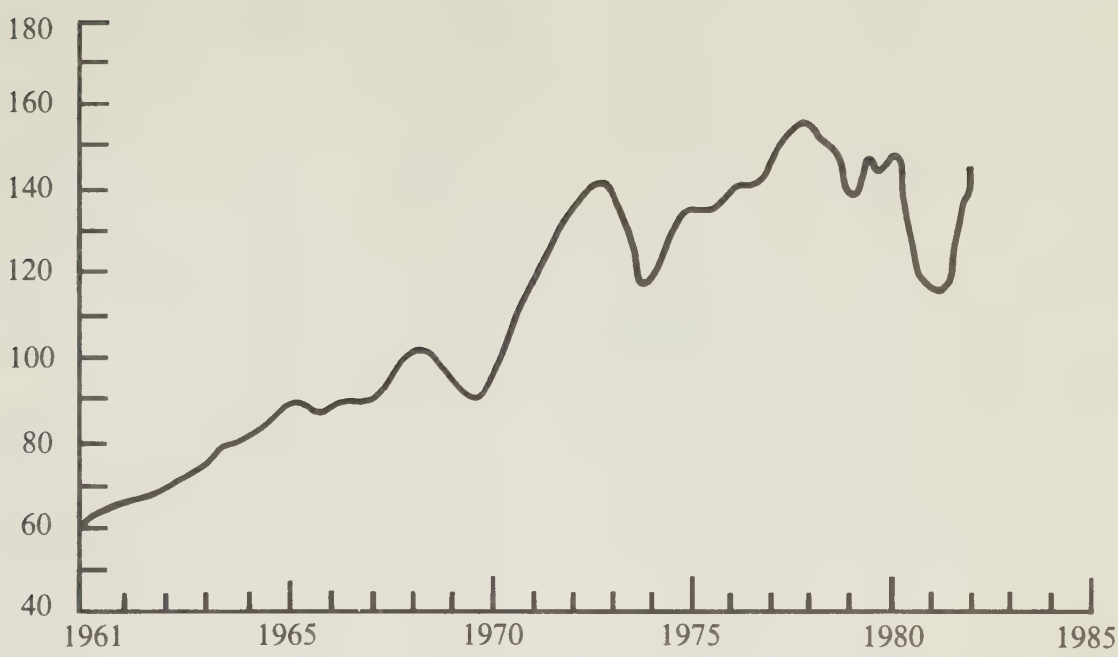
fiscal policy using the average multipliers from Helliwell. The results of this exercise are that the discretionary fiscal policy employed over the 1971–81 period stabilized the path of income relative to its path under a fixed fiscal rule. (McCallum repeated the exercise using The Informetrica Model and reported similar results.)

While these results are informative and interesting, they suffer from their exclusive focus on the effects of fiscal policy on output and employment. No consideration is given to the “other” policy objective of stabilizing and reducing inflation. This begs the important question of whether fiscal expansion fuelled the inflation of the 1970–74 period and frustrated the policy of monetary gradualism over the latter half of the 1970s. It is also the case that expectations-effects may bias the results. We return to these issues later.

### The Record of Fiscal Policy, 1962–84

In a recent study for Statistics Canada, Cross (1983) has provided quarterly reference dates for business cycles in the Canadian economy since 1950. Figure 1-1 shows the evolution of the composite leading index

**FIGURE 1-1    The Canadian Composite Leading Index (1971 = 100),  
1960–83**



Source: Cross, Phillip, “The Business Cycle in Canada 1950–81,” special study in Statistics Canada, *Current Economic Analysis* (September: 1983): xxii–xxxii.

and identifies the cyclical phases. The sharp difference in performance between the 1960s and the 1970s stands out (see Table 1-6).

The 1960s witnessed remarkably steady economic growth following the recession in 1960–61. There were two later downturns in the decade — one in January 1967 and one in February 1970 — but both were minor enough that Cross did not consider them as cyclical contractions. However, the 1970 downturn was severe enough and the policy developments interesting enough that we treat it as a distinct cyclical phase.

In contrast, the 1970s appear as a decade of more volatile and lower average performance. Average growth of real GNP fell from 5.2 percent in the 1960s to 4.2 percent in the 1970s. There were two recessions in the decade — one beginning in June 1974 and one beginning in November 1979. A third recession, the “Great Recession,” began in June 1981 and lasted until the end of 1982.

We now examine the federal budgets over the period 1962–84. Table 1-7 provides an overview.

**1962–69: Expansion**

The Canadian economy expanded vigorously during the early part of the 1960s. Real GNP growth averaged over 6 percent annually, and the unemployment rate fell steadily through 1967. Inflation as measured by

**TABLE 1-6 Inflation, Unemployment and Growth, 1962–83**

	<b>Inflation Rate CPI</b>	<b>Nominal Wage Settle- ments<sup>a</sup></b>	<b>Real Wage Settle- ments<sup>b</sup></b>	<b>Un- employ- ment Rate</b>	<b>Growth in Real GNP</b>
1962	1.2	3.5	2.3	5.9	6.8
1963	1.8	3.1	1.3	5.5	5.2
1964	1.8	3.1	1.3	5.5	5.2
1965	2.5	5.4	2.9	3.9	6.7
1966	3.7	7.9	4.2	3.3	7.0
1967	3.6	8.3	4.7	3.8	3.3
1968	4.1	7.9	4.2	3.3	7.0
1969	4.5	7.7	3.2	4.4	5.3
1970	3.3	8.6	5.3	5.7	2.5
1971	2.9	7.8	4.9	6.2	6.9
1972	4.8	8.8	4.0	6.2	6.1
1973	7.5	10.9	3.4	5.5	7.5
1974	10.9	14.7	3.8	5.3	3.6
1975	10.8	19.2	8.4	6.9	1.2
1976	7.5	10.9	3.4	7.1	5.9
1977	8.0	7.9	–.1	8.1	2.0
1978	8.9	7.1	–1.8	8.3	3.6
1979	9.1	8.7	–.4	7.4	3.2
1980	10.1	11.1	1.0	7.5	1.1
1981	12.5	13.3	.8	11.1	3.3
1982	10.8	10.0	–.8	11.1	–4.4
1983	5.8	5.6	–.2	11.9	3.3

*Source:* Statistics Canada.

a. Wage settlements excluding construction, excluding COLA compound average annual increase in base rates.

b. Wage settlements minus CPI inflation rate.

the consumer price index (CPI) rose steadily from a low of 1.2 percent in 1962. Interest rates also rose steadily.

Strong demand in both the private and public sectors as well as in exports contributed to the sustained growth. Demand pressure from the provincial-local sector rose throughout the 1960s with the need for schools, hospitals, and social services provided at the local level; combined provincial-local spending rose from 13 to 23 percent of GNP between 1960 and 1970.

By late 1965 inflation was recognized as a problem in both the United States and Canada. American monetary policy was tightened in late 1965 and 1966, and Canadian short-term interest rates followed American rates upward. The constraining effect of high interest rates on inflation in Canada was minimal.

Following a short pause in early 1967, strong growth continued to the end of the decade. Inflation and interest rates continued to rise, both in

TABLE 1-7 Cyclical Phases and Federal Budgets, 1962–84

Budget Date	Finance Minister	Stance	Highlights
1962–1969 — Expansion			
June 1963	Gordon	Restraint	Foreign ownership
March 1964	Gordon	Status Quo	
April 1965	Gordon	Mild Stimulus	Pro-cyclical
March 1966	Sharp	Restraint	Investment restraint
December 1966	Sharp	Status Quo	Tax increases for OAS
June 1967	Sharp	Mild Stimulus	Stop-Go?
November 1967	Sharp	Restraint	Reversal
October 1968	Benson	Anti-Inflation	Surtax
June 1969	Benson	Anti-Inflation	Capital cost allowance deferrals tariff reductions
1970 — Slowdown			
March 1970	Benson	Status Quo	
December 1970	Benson	Stimulus	Pro-cyclical?
1971–1974:1 — Recovery and Expansion			
June 1971	Benson	Stimulus	Carter Report
May 1972	Turner	Stimulus	Accelerated depreciation
February 1973	Turner	Stimulus	Supply side, tax indexation
1974:2–1975:1 — Downturn (Stagflation)			
May 1974 <sup>a</sup>	Turner	Stimulus	Supply side
November 1974	Turner	Stimulus	Supply side
1975:2–1979:4 — Recovery and Expansion			
June 1975	Turner	Status Quo	Some restraint measures
October 1975	Macdonald	Anti-Inflation	AIB
May 1976	Macdonald	Status Quo	
March 1977	Macdonald	Stimulus	Tax cuts
October 1977	Chrétien	Stimulus	
April 1978	Chrétien	Stimulus	Provincial sales tax cuts
November 1978	Chrétien	Stimulus	Tax cuts
December 1979 <sup>a</sup>	Crosbie	Restraint	Deficit reduction
1980:1–1980:2 — Contraction			
October 1980	MacEachen	Status Quo	NEP
1980:3–1981:2 — Expansion			
1981:3–1982:4 — Contraction			
November 1981	MacEachen	Restraint	Tax Reform
June 1982	MacEachen	Anti-Inflation	“6 and 5”
1983:1 — Recovery			
April 1983	Lalonde	Mild Stimulus	Tilt
February 1984	Lalonde	Status Quo	Expenditure taxation

a. Defeated in House and led to a federal election.

Canada and the United States. Restrictive policy was introduced in both countries late in 1968 and continued through 1969. Growth and inflation slowed, while unemployment rose.

**Budget — June 1963.** The first budget of the Liberal minority government elected in April was one of restraint, both in terms of rhetoric and reality. To reduce the deficit, a number of taxes were raised, and the excise tax exemption for a number of capital goods, including building materials, was eliminated. (Public disapproval led the government to remove the exemption only gradually.) A one-time increase in revenues of \$220 million was to be obtained by moving the payment period for corporate income taxes forward by two months. Certain tax “loopholes” were also to be closed. New initiatives to combat unemployment included the creation of a Department of Industry, an increase in winter works assistance in designated areas, and accelerated depreciation allowances for manufacturing and processing firms at least 25 percent Canadian owned. One effect of this budget was that the cyclically adjusted deficit fell in 1963 and moved into surplus in 1964.

Another goal of the budget was to reduce foreign direct ownership of Canadian industry. Two changes were recommended: a 30 percent tax on sales of domestic corporations to non-residents, and a 5 percent increase in the withholding tax on firms with less than 25 percent Canadian ownership combined with a 5 percent reduction in the rate for Canadian firms. Public reaction to the proposals was so adverse that the takeover tax was withdrawn, and the increase in the withholding tax for foreign firms was eliminated in the next budget.

**Budget — March 1964.** Perhaps because of the political difficulties encountered with the previous budget, this one recommended few changes. The fairly strong growth of real economic output in 1963 (5.2 percent) plus the favourable prospects for 1964 may also have contributed to the choice of a fairly conservative budgetary stance. The finance minister claimed that the government had been under pressure to implement tax cuts similar to those that had been recently introduced in the United States. The suggestion was rejected, however, in part because of the larger per capita deficit in Canada, and in part because the minister wanted to wait for the report of the Royal Commission on Taxation, expected in late 1964, before proposing any major tax changes.

Real output in 1964 was forecast to rise 5.5 percent, and the deficit for 1964–65 was expected to rise slightly to \$40 million. Output actually rose by 6.7 percent, and the projected deficit became a surplus of \$396 million. The economy was at full employment by 1964 so this surplus was also present on a cyclically adjusted basis.<sup>11</sup>

**Budget — April 1965.** By most standards the economic situation in

early 1965 was extremely good. Real GNP growth in 1964 was 6.7 percent, and there was no reason for supposing that 1965 would not also be a good year. The CPI inflation rate in 1964 was a low 1.8 percent. No major counter-cyclical policies were introduced; indeed, there was a mildly pro-cyclical personal income tax reduction.

A deficit of \$152 million was forecast for the 1965–66 fiscal year, less than the surplus in 1964–65 partly because of the \$265 million cost of the tax reduction. However, the strength of the economic boom was again underestimated, and the actual surplus was \$593 million; an only slightly smaller surplus remained on a cyclically adjusted basis. (An election was called in November of 1965.)

**Budget — March 1966.** Inflation was a major issue by 1966. The economy was operating at or above capacity and labour shortages were widespread. As an anti-inflationary measure, government spending, especially for construction projects, was reduced. The personal income tax cut of the previous budget was moderated. Business investment spending was to be restrained by three measures: the sales tax on most machinery and equipment was to be removed in the future, thus encouraging firms to defer capital expenditures; the capital consumption allowance that could be claimed on certain assets was reduced; and, a 5 percent tax on corporate income was to be collected on a monthly basis beginning in May and refunded to firms 18 months later.

In September more anti-inflationary programs were introduced. The rate of increase of funding for research grants was cut back, and capital expenditures continued to be restricted. The major change, though, was the deferral of the date the new medicare act would take effect by one year to July 1, 1968.

**Budget — December 1966.** By December economic growth had begun to slow. In the minibudget introduced in December the finance minister stated that revenues would be smaller than had been predicted in March. Taxes were to be raised by approximately \$300 million a year to cover the costs of implementing the Guaranteed Income Supplement (GIS) for old-age pensioners about to be passed in the House of Commons.

**Budget — June 1967.** Demand had slowed enough that restraint policies were no longer perceived to be necessary; several expansionary measures were introduced. In retrospect the policy reversals in this budget appear as overreaction to what turned out to be only a temporary pause in growth.

Although GNP growth slowed in 1967, prices and particularly wages continued to rise. Wage rates were rising faster than productivity, and fears were expressed that slow productivity growth would be a major

problem in the future. To help increase productivity, funding was increased for education and retraining and for research and development, and measures were introduced to increase labour mobility.

**Budget — November 1967.** The magnitude of federal borrowing that would be required to finance the deficit, combined with rising American interest rates and expectations of inflation, led to predictions that Canadian interest rates would rise. To ease the pressure on capital markets, the finance minister announced in November that he would be making an effort to balance the budget in the next fiscal year. Both direct and indirect taxes were raised, and limits were placed on the growth of the public service. This appears to be recognition of the error of the June 1967 budget. The Bank of Canada stated that the finance minister's announcement led to an improvement in the capital markets.

The tax proposals were defeated in the House of Commons in February 1968, and more moderate tax increases were then introduced. The revenue collected was expected to be less than under the original proposals, but an extra \$75 million was expected to come from a reduction in expenditures and a freeze on the size of the civil service effective March 1.

**Budget — October 1968.** The October 1968 budget speech declared that the government's most urgent need was to reduce inflation. Total federal government expenditures other than for medicare were to be limited to rise by 5.5 percent, and the freeze on public service hiring was to be continued. Revenues were expected to rise by \$440 million in 1969–70 because of a 2 percent surtax on taxable personal incomes to a maximum of \$120. The 3 percent surcharge that had been introduced in March was to be terminated at the end of 1969. A further acceleration of corporate income tax payments was expected to yield \$275 million in 1969–70.

Assuming GNP growth of 4.5 percent in 1968, a surplus of approximately \$250 million for 1968–69 was expected. However, even though output rose by more than 5 percent in both 1968 and 1969, the surplus reached only \$75 million.

**Budget — June 1969.** In his June 1969 budget the minister of finance announced that "we really mean business in the fight against inflation." The surtax on basic personal income tax and on corporate income tax was to be extended to December 31, 1970, and the capital consumption allowance on new commercial buildings was to be deferred for two years, except in small towns and in provinces with high unemployment rates. Another anti-inflationary policy was the immediate implementation of the Kennedy Round tariff reductions, originally scheduled to take place in stages.

The surplus forecast for 1969 was correctly expected to be the largest

since 1956–57; the surplus rose both because of the strong upswing in the economy in 1969 and because of the fiscal constraint.

## ***1970 — Slowdown***

Following the continuous expansion that had occurred over the 1962–69 period, a slowdown began in the first quarter of 1970. Real growth of gross domestic product (GDP) was only 2.5 percent in 1970, while the unemployment rate rose from 4.4 percent in 1969 to 5.7 percent in 1970 and 6.2 percent in 1971.

Although this slowdown was not considered serious enough by Cross (1983) to be classified as a cyclical contraction, we isolate it here because it is an interesting cyclical phase from the perspective of stabilization policy. It appears to have been a policy-induced slowdown, largely caused by the restrictive fiscal and monetary policy stance pursued in Canada and to some extent in the United States.

The slowdown in Canada, and the resulting fall in inflation, led to a large balance of payments surplus in 1970. The Bank of Canada tried with very little success to offset the effects on the money supply, and on May 31, 1970, the Bank announced that it would no longer maintain the fixed foreign exchange value of the Canadian dollar. The newly floating Canadian dollar appreciated substantially.

**Budget — March 1970.** Despite the slowdown in the economy, inflation was still a concern in the March 1970 budget. Consumer credit was to be constrained by a minimum down payment requirement and a limit on the repayment period. However, in June this plan was abandoned because of the moderation of inflation and the currency appreciation that was expected to contribute to price stability. The deferral of capital cost allowances for commercial construction projects in Alberta, British Columbia, and Ontario was also extended until the end of 1971.

The surplus in 1970–71 was expected to be quite a bit lower than in 1969–70 because of both the automatic reduction in revenues caused by the recession and the higher transfer payments to the provinces. Assuming a 3 percent increase in real GNP, a surplus of \$180 million was forecast. As Table 1-1 shows, the budget moved into deficit in 1971, and the cyclically adjusted surplus fell sharply from 1969 right through 1971.

**Budget — December 1970.** Later in the year the government became more concerned about unemployment, and fiscal policy became expansionary. Payments to the provinces were increased, and an additional \$60 million was allocated to job creation in areas with severe unemployment. The changes announced after the March budget were expected to raise expenditures by \$350 million and reduce revenues by \$50 million, which changed the initial forecast of a surplus into a deficit.

In the December supplementary budget, funding for capital projects in high unemployment regions was increased, the capital budget of Central Mortgage and Housing Corporation (CMHC) was expanded, unemployment insurance benefits were increased by 10 percent, and producers were allowed to value new investment in machinery, equipment, and structures at 115 percent of actual cost until March 31, 1972. To help meet the cost of higher expenditures, the 3 percent surtax on personal and corporate income was extended until December 31, 1971.

The deficit was expected to reach \$570 million in 1970–71, but the actual deficit was only \$89 million. Again this reflected a tendency on the part of the government to underestimate the strength of the economy.

### *1971–74 (Jan.–Mar.): Recovery and Expansion*

Lower interest rates and stronger economic growth in the United States and the rest of the world contributed to Canadian GNP growth in the early 1970s. Real GNP grew at an average annual rate of 6 percent from 1971 to 1974 compared with 5.2 percent during the 1960s.

The force of the boom in the early 1970s was not fully appreciated in many countries. Until quite late in the expansion, most governments thought that their problem was to reduce slack in the economy rather than to contain excess demand. This mistaken diagnosis was to a great extent caused by a shift in the relation between the recorded unemployment rate and the pressure of excess demand. The shift reflected a rise in the amount of unemployment associated with full-capacity output, the natural rate of unemployment.<sup>12</sup>

Accustomed to booms being indicated by unemployment figures of 3 percent and normal capacity output by 4 percent, the government watched actual unemployment rise steadily from 4.4 percent in 1969 to over 6 percent in 1971 and 1972 and then come down only slightly to 5.5 percent in 1973. It would not be surprising if some policy makers were misled into thinking there was substantial excess capacity in the economy in 1972 and even 1973, for at the time there was no consensus among economists that the natural rate of unemployment had risen.<sup>13</sup>

Expansionary monetary policy was introduced in the United States in the early 1970s. A widely held view is that the Bank of Canada failed to avail itself of the opportunity to run an independent monetary policy provided by the flexible exchange rate system. By mimicking the expansionary monetary policy in the United States, the Bank essentially ran a “dirty fixed exchange rate.” (For further discussion, see Purvis, 1977.) As would be expected with a “fixed” exchange rate, the Canadian inflation rate followed the American rate upward throughout the period.

Fiscal policy also contributed to expansion during this period. Canadian and American fiscal policy was expansionary partly in response to the persistently high unemployment rates as measured against 1960s

standards and also because expansion was made more acceptable by rather low inflation rates arising from the 1969–70 slowdown. Some provincial governments also began to apply expansionary policies during the early 1970s.<sup>14</sup>

In the early 1970s a number of events caused prices to rise. Expansionary fiscal and monetary policies in most industrialized countries, including Canada and the United States, created a surge in demand. On the supply side, harvest failures and petroleum price hikes led to inflation in all industrialized countries. In 1974–75 wages began to reflect the surge in inflation: wage settlements excluding cost of living allowances (COLA clauses) showed an average annual increase of 14.7 and 19.2 percent in 1974 and 1975 respectively.<sup>15</sup>

**Budget — June 1971.** The June 1971 budget introduced tax reforms resulting from the Carter Royal Commission on Taxation. These had little direct macroeconomic impact, however, since the purpose of the reforms was to increase the equity and efficiency of the tax system without altering total tax revenues. They did, however, raise marginal tax rates and therefore strengthen the automatic stabilizers.

Fiscal policy in 1971 was more expansionary than in 1970. The actual federal budget moved into a deficit position, (\$145 million) and the structural surplus fell by \$640 million. Policy changes were enacted in several areas. Transfers to the provinces were raised; some social welfare programs were made more generous, with the major change being the broadening of unemployment insurance benefits; Department for Regional Economic Expansion (DREE) grants were increased; grants were made to aid agriculture; and taxes were cut. The cost of all these changes was estimated at over \$1 billion.

**Budget — May 1972.** In the May 1972 budget the finance minister claimed that his most urgent priority was job creation. Accelerated depreciation was introduced whereby 50 percent of the cost of newly produced machinery and equipment for use in manufacturing and processing could be written off each year, rather than the existing 20 percent. (Some change in the tax system may have been necessary in any case to reduce the adverse effects of inflation on the depreciation deduction which is based on historical cost rather than replacement cost.) The top corporate tax rate in manufacturing and processing was reduced from 47 to 40 percent, and from 25 to 20 percent for small firms, effective January 1, 1973. Measures meant to increase personal expenditures and improve the equity of the tax system were introduced, including the indexation of the Old Age Security (OAS) and Guaranteed Income Supplement (GIS) and an increase in the age exemption to \$1000 from \$650.

The prediction of 6 to 6.5 percent real growth proved to be an under-

estimate; real GNP grew by 6.1 percent in 1972 and 7.5 percent in 1973. Because of this vigorous growth the deficit in 1972–73 was only \$200 million, \$250 million less than the original prediction of \$450 million. On a calendar-year basis, the cyclically adjusted deficit was \$665 million, but the inflation adjustment reduced this so that the structural deficit was only \$171 billion.<sup>16</sup>

**Budget — February 1973.** The February 1973 budget was described by the finance minister as being “strongly expansionary.” The main priorities were to reduce unemployment by encouraging faster growth, to reduce inflationary pressures, and to offset the effects of past inflation. A number of tax reductions, costing \$1.3 billion in total were implemented. Excise and sales taxes on a number of consumer items were removed. Tariffs were cut for one year on a number of food and consumer goods on which the tariff rate exceeded the average of 15 percent. (These lower tariffs were maintained every year until 1978 when permanent changes were made following the General Agreement on Tariffs and Trade (GATT) negotiations.) Old age pensions were increased, and the basic personal exemption was increased by \$100. These largely “supply side” measures were instituted in the hope they would stimulate employment growth while not exacerbating inflation.<sup>17</sup>

The major change in the budget was, however, the indexing of the personal and marital exemptions to the CPI. This change was meant to help offset distortions that inflation creates for the tax system.

While the rhetoric of the 1973 budget was expansionary, in effect federal fiscal policy in 1973 was somewhat less expansionary than in the previous year. In part, this was because attention focussed on the behaviour of the actual deficit, which was expected to grow substantially. In fact, the recovery and increased inflation meant that the actual deficit did not grow. In 1972–73 the actual deficit was \$200 million, half the forecast amount, while in 1973–74 a forecast deficit of \$640 million turned into a surplus. The cyclically adjusted deficit in 1973 was \$590 million and the structural balance went from a deficit in 1972 to a surplus in 1973.

### ***1974 (Apr.–June)–1975 (Jan.–Mar.): Downturn (Stagflation)***

The peak of the cycle can be dated at the first quarter of 1974. Inflation reached double digits and became the top priority. To some extent the inflation was caused by demand pressures fuelled by expansionary policies pursued in the early 1970s, but much was also due to exogenous price increases — especially for food and energy.

In the United States aggregate demand was reduced primarily through contractionary monetary policy. The ensuing recession in the United

States affected the Canadian economy in two ways. First, higher American interest rates meant higher Canadian rates. Second, as growth in the American economy began to decline Canadian exports fell off. Nevertheless, Canada's performance during the 1974–75 recession was still better than that of most industrialized countries. While real GNP fell in the United States, in Canada it rose by 3.6 and 1.2 percent in 1974 and 1975, respectively. The main reason for this difference was that a high level of demand was maintained, at least partly because of the federal government's expansionary fiscal stance and because energy-related investment remained strong. However, the current account balance fell from \$0.1 billion in 1973 to -\$4.7 in 1975.

Another problem facing the Canadian economy was adjusting to higher energy prices. The 1973 oil crisis had a favourable terms-of-trade effect on the Canadian economy because of Canada's position as a net energy exporter. However, Canada is also the largest energy user per capita and per unit of output in the Organisation for Economic Co-operation and Development (OECD).<sup>18</sup> This meant that the structural adjustments and real income losses of the non-energy sector were large compared to those in other OECD countries. The costs involved in making structural adjustments would offset some of the gains from terms-of-trade changes.

In 1975 the three largest provinces all adopted expansionary policies, the first time they had acted in unison in response to recession. The three major policies of the Ontario government were a temporary reduction of the sales tax from 7 to 5 percent, a temporary grant to first-time home buyers, and temporary removal of the sales tax on new cars. Quebec attempted to stimulate employment by increasing investment in the public and para-public sectors by 40 percent. In 1975 provincial-local expenditures rose by 21.3 percent, while revenues, dampened by the recession, rose by only 14.7 percent. Part of the reason for this expenditure explosion seems to have been the escalation of wage demands.

**Budget — May 1974.** Inflation was considered the highest priority in May 1974. However, the finance minister rejected the idea of slowing inflation by reducing aggregate demand, since "the effect of this would be stagnation and rising unemployment. In my judgement such a cure would be worse than the disease" (*Budget Speech*, May 6, 1974, p. 6). Instead, supply-side measures to encourage investment and reduce costs were introduced, along with tax breaks geared at easing the burden of inflation on people with a fixed income. The cut in indirect taxes (to lower prices) was accompanied by an increase in direct taxes on corporations.

The May 1974 budget failed to meet its stated objective of reducing inflation. For this purpose, it was ill conceived. Indeed, following several years of strong performance and expansionary policy, it seems to have

been too expansionary. However, given the severity of the U.S. recession that occurred in 1974–75, the May 1974 budget might have turned out to be constructive in stabilizing Canadian output and employment. In any event, the May 1974 budget was defeated in Parliament, primarily because of opposition to the proposals on resource taxation.

**Budget — November 1974.** The July election returned a Liberal majority to Parliament. The budget introduced in November was more expansionary than the May budget and included changes relating to oil and equalization. The minister of finance noted the fall in the number of new housing starts and the poor economic performance of Canada's trading partners; consequently, the November 1974 budget was very expansionary. Notably, the expansion, perhaps inappropriate when first proposed in May, appeared more appropriate in November.

A number of measures were introduced to aid the housing industry: the sales tax on building materials was cut from 12 to 5 percent, at an anticipated cost of \$450 million; capital cost allowances on new multiple-unit residential buildings started before December 31, 1975, were made eligible deductions against any source of income; a \$500 grant to all first-time home buyers purchasing new, moderately priced housing within one year was introduced; and the registered home ownership savings plan (RHOSP) was also introduced. (The effect of the latter was, of course, contractionary.) Some quite extensive personal tax cuts were in the budget, including a measure to help correct the implicit inflation tax on savings: the first \$1,000 of interest income was made tax exempt. (In 1975 dividend income was also allowed in the first \$1,000.)

The tax cuts did help sustain aggregate demand in 1975. However, exports continued to fall in volume terms, the current account deficit reached unprecedented levels, and the merchandise trade account went into a deficit position in 1975 for the first time since 1960.

Corporate profits had been high in 1972–73; in order to raise revenue, a 10 percent surtax was put on corporate profits from May 1, 1974, to April 30, 1975. Small firms and those in manufacturing and processing industries were exempt, as were firms in the petroleum and mining industries, which were subject to separate tax increases. However, taxes on small firms were reduced through an increase in the profit limit from \$50,000 to \$100,000 for firms to be eligible for the 25 percent small business tax rate.

Government expenditures were anticipated to rise by only 15 percent in 1975–76, compared to a 25 percent rise in 1974–75. But even assuming a respectable 4 percent growth rate of GNP in 1975, the deficit was expected to rise to \$1.5 billion in 1975–76 from a near zero balance the previous year. As it happened, real growth of GNP reached only 1.2 percent in 1975 and the deficit swelled to \$3.9 billion, more than twice the original estimate. This was another case of the government overestimating the strength of the economy.

## ***1975 (Apr.–June)–1979 (Oct.–Dec.): Recovery and Expansion***

The period from 1970 to 1974 is generally agreed to be one of rapid growth and increasing inflationary pressure. The recovery and expansion from 1975 to 1979 are more complicated. While output and employment growth was strong through this period, capacity and labour force participation grew even more rapidly; as a result, the unemployment rate and the output gap both steadily increased during the period. However, we shall follow Cross (1983) and the Department of Finance (1983, pp. 55–61) in interpreting this period as one gradual expansion; for further discussion, see McCallum (1983).

The expansionary stance of the total government sector has been credited with reducing the impact of the recession that affected most countries in 1974 and 1975. In 1974 GNP grew by 3.6 percent in real terms, while it fell by 0.6 percent in the United States. The automatic stabilizing effect of lower tax revenues was augmented by some discretionary fiscal stimulus (see Table 1-1).

Because aggregate demand was maintained in 1974–75, wage demands were strong; increasing wage costs contributed to the high inflation rate recorded in 1975. By October 1975 inflation was considered a serious enough problem that wage and price controls were introduced under the Anti-Inflation Board (AIB). Monetary gradualism was formally adopted by the Bank of Canada in September 1975.

The Canadian dollar fell sharply after 1976; the resulting lower unit labour costs combined with a recovery in the United States contributed to an improvement in export performance over the second half of the decade. Relatively expansionary monetary and fiscal policies in the United States allowed real GNP in that country to grow at an average annual rate of 4.6 percent from 1976 to 1979. Not only did this improve Canadian export performance, but low American interest rates allowed Canadian real interest rates to remain very low and even occasionally to become negative.

Canadian GNP growth was weaker than American growth from 1977–79, averaging 3 percent per year. Although the 1976–79 period experienced a slow recovery, the unemployment rate did not fall until 1979. The rate had been on an upward trend since the fourth quarter of 1976, and in 1977 it reached levels not attained during the worst of the 1967–68 and 1970 slowdowns.<sup>19</sup> For this reason some stimulus was perceived as necessary, especially in slow-growth regions. One of the features of fiscal policy during this period was that tax cuts, rather than expenditure increases, were employed whenever possible. This was partly because tax cuts have desirable supply-side effects and exert a downward impact on prices, and partly to limit the size of federal government expenditures.

In 1976, provincial governments became more concerned with controlling expenditures, and the provinces agreed to cooperate with the AIB. In budget speeches presented in 1976, the treasurers of the three largest provinces all stressed the importance of limiting the size of deficits to maintain their provinces' financial integrity. Provincial policies remained restrictive during the second half of the 1970s. By 1979 the provincial-local sector net position had turned into a surplus for the first time since 1947. However, this was caused chiefly by the surpluses of the three largest petroleum producing provinces — Alberta, Saskatchewan and British Columbia.

**Budget — June 1975.** The June 1975 budget was not strongly contractionary, but increasing inflation and the growing deficit created a perceived need for restraint. Capital programs were postponed or reduced; the growth rate of personnel years in the federal public service was limited to the 3.1–4.1 percent range, down from the range of 6–7 percent from 1973 to 1975; wage and salary increases were to be limited using the collective bargaining process; a ceiling was put on transfers to the provinces for health care, which rose by 19.2 percent in 1974 and had been consistently rising faster than GNP; and changes in the Unemployment Insurance Act reduced benefits, tightened eligibility, and increased premiums. Some tax increases were also introduced: the maximum personal income tax credit was reduced, and a 10 cent per gallon excise tax on gasoline for personal use was put into place.

Approximately \$0.5 billion was allocated to direct job creation and training, and some minor measures were introduced to stimulate residential construction. To encourage investment, interest earned on long-term corporate securities was made exempt from the non-resident withholding tax, and a 5 percent investment tax credit was introduced on machinery and equipment used in the manufacturing, processing, petroleum, minerals, logging, farming, and fishing industries.<sup>20</sup>

**Budget — October 1975.** The October 1975 “mini-budget” introduced a package of policies designed to combat inflation and inflation expectations. The centrepiece of the package was a prices and incomes policy that limited increases in income, prices, profits, professional fees, and dividends; in addition, the AIB was set up to administer the program. Other features of the program were a policy of reducing government expenditure, structural policies to help reduce inflation, and fiscal and monetary policies that would not contribute to inflation.

On November 3, a number of measures to encourage residential construction were presented under the Federal Housing Action Program. On December 18, expenditure reductions of \$1.5 billion were announced, with the major cuts being a limit on the growth of the federal public service to 1.5 percent in 1976–77, suspension of the indexation of

family allowance payments for one year, a freeze on the budget of the Department for Regional Economic Expansion (DREE) at its 1975–76 level, a reduction in construction of public buildings, and the termination of Information Canada.

**Budget — May 1976.** Recovery in the United States and other developed countries was expected to stimulate growth in Canada, and therefore the emphasis of the budget was on restraint. However, the structural deficit grew rapidly over the ensuing twelve months.

The government's commitment to reducing government expenditures was restated, but no new proposals were made. A few minor tax changes were introduced including a doubling of the income tax deduction for child care expenditures to a maximum of \$1,000 per child and \$4,000 per family, and an increase in the maximum allowable deduction for registered pension plans.

The deficit in 1976–77 was expected to fall by \$900 million to \$3.8 billion, and by a further substantial amount in 1977–78. But even with fairly strong growth of real GNP of 5.8 percent in 1976, the deficit did not fall and actually rose to \$4.2 billion in 1976–77. Further, the structural deficit now started to indicate a marked upward trend.

**Budget — March 1977.** Unemployment was rising so some stimulus was deemed necessary. Direct funding for job creation was increased from \$358 to \$458 million. Corporate income taxes were reduced by a number of measures, including expanding the coverage of the corporate tax credit first introduced in 1975 and increasing the tax credit rate in slow-growth regions from 5 to 7.5 percent. Personal income taxes were reduced through an increase in the employment expense deduction from \$150 to \$250, and a \$50 child tax credit was introduced. Corporate income tax cuts were estimated to cost \$0.7 billion and personal income tax cuts \$0.4 billion.

Assuming a 4 percent growth rate of real GNP in 1977, the deficit in 1977–78 was expected to rise to \$5.7 billion. The increase was anticipated in spite of measures introduced earlier in the year to reduce oil subsidy payments, the cost of the unemployment insurance program (by increasing the qualification period), and health and welfare costs (because of the new federal-provincial fiscal arrangements).

**Budget — October 1977.** More stimulus was considered necessary because the unemployment rate had reached levels unprecedented in the postwar period. The main proposals were \$150 million for job-creation programs, a \$100 million employment credit scheme for firms recruiting designated unemployed individuals, and an increase in the minimum personal income tax credit of up to \$100. The total cost of the changes was expected to be approximately \$1 billion. The deficit estimate for

1977–78 was increased to \$8.3 billion, which was quite a bit higher than the March estimate because the growth of real GNP was only 2 percent in 1977, rather than the 4 percent originally expected. This was still an underestimate as the actual deficit went to \$9.4 billion.

**Budget — April 1978.** The centrepiece of the April 1978 budget was a proposal to reduce the provincial retail sales tax by 2 percent for six months if the provinces agreed to finance either a reduction of another 1 percent for six months or 2 percent for three months. The Atlantic provinces were offered a reduction of 3 percent entirely financed by the federal government for six months because of their poorer ability to pay. The total cost of the program was expected to be \$1.1 billion with the cost divided evenly among the richer provincial governments, federal deficit financing, and federal expenditure reductions. The reductions in provincial sales taxes were at least partly responsible for the large increase in the budget deficits of Ontario and Quebec in 1978.

The program's positive aspects were that it would expand output while lowering prices. It was expected to reduce the average price level by one percent during the period it was in effect. However, its actual effect on prices was transitory and relatively small.

Other stimulative measures included an increase in write-offs for research and development, incentives for development of the oil sands and secondary recovery of oil, and for investment in railways.

A deficit of \$9.25 billion was anticipated for 1978–79, very close to the actual outcome of \$9.6 billion. The structural deficit as a fraction of GNP reached an all-time high of 3.6 percent in 1978, as shown in Table 1-2.

**Budget — November 1978.** During the summer there was a shift in government policy towards greater restraint. In August the prime minister announced the government was committed to cuts in government spending totalling \$2 billion, zero growth in the federal public service, maintaining a tougher position in public sector wage negotiations, lower taxes, and that it would begin to take measures to turn the Post Office into a Crown corporation.<sup>21</sup> Later in the month the minister of finance announced cuts in family allowances and unemployment insurance benefits, an increase in the Guaranteed Income Supplement (GIS), a reduction in the excise tax on gasoline and a new, refundable, child tax credit.

The November 1978 budget, like many earlier budgets, employed tax policy to stimulate the economy, while aiming at reducing costs. The federal manufacturers' sales tax was reduced from 12 to 9 percent indefinitely. The maximum employment expense deduction was doubled to \$500 at a cost of \$0.27 billion in personal income tax revenues in 1979–80, and unemployment insurance premiums were reduced at a cost of \$0.3 billion. Various measures were announced to encourage business fixed investment including an increase in the investment tax credit basic rate

from 5 to 7 percent, and from 7.5 to 10 percent and from 10 to 20 percent in slow-growth regions. The tax credit was also expanded to include transportation equipment.

**Budget — December 1979.** The May 1979 election led to the replacement of the Liberal party with a Conservative minority government. In December 1979 a budget was introduced with one of the major goals being a reduction in the size of the deficit. The annual rate of growth of government expenditures was to be limited to 10 percent and a number of taxes were to be raised. A two-year, 5 percent surcharge on corporate profits and an increase in unemployment insurance premiums were proposed. An excise tax of 25 cents a gallon on gasoline, which was to be a major issue in the next election, was also put forward.

The Clark government fell on the issue of the budget and the February 1980 election returned a Liberal majority government, so the December budget never came into effect. But in April 1980 the new finance minister reintroduced two measures from the December 1979 budget: the 5 percent corporate income tax surcharge, and increases in excise taxes on alcohol and tobacco.

### ***1980 (Jan.–Mar.)–1980 (Apr.–June): Contraction***

By 1979 the boom in the United States plus the second oil shock caused inflation to rise quickly, leading to the adoption in the United States of a restrictive monetary policy. Probably the single most important exogenous factor influencing the Canadian economy from 1979 to 1982 was the roller coaster pattern of American interest rates. The rise in interest rates that began in late 1979 peaked in April 1980 with the rate on 30-day commercial paper reaching 18 percent. Then followed, in only six weeks, a sharp fall in rates on the order of 10 percentage points. This reversal of policy allowed income to rise in the second half of the year.

In Canada interest rates did not rise by as much, in part because the exchange rate was allowed to fall and in part because of capital inflows related to the energy sector. However, when American rates fell Canadian rates also did not fall as much.

**Budget — October 1980.** Dealing with the second energy price shock was the major concern of the October 1980 budget. Its main feature was the introduction of the National Energy Program (NEP) designed to increase the federal government's share of the revenues from petroleum production, to increase Canadian ownership of the petroleum industry, and eventually to attain Canadian energy self-sufficiency. The NEP had a number of very controversial aspects, especially its treatment of the provinces and foreign firms.

The minister of finance stated that the main elements of the budget

were to maintain government expenditure growth within the growth rate of GNP, reduce the deficit, avoid policies that would accommodate inflation, and — whenever possible — avoid tax increases. Tax increases were to be avoided because the economy was weak and because they contribute to inflation, although taxes on alcohol and tobacco were converted to indexed specific taxes. Unemployment insurance premiums were also raised. The investment tax credit was raised to 50 percent in specially designated high unemployment areas until 1985.

The economy began to recover during the second half of 1980, but because of the downturn earlier in the year the budget forecast negative growth during 1980 and a deficit of \$14.2 billion in 1980–81. Output actually rose by 1 percent in 1980 and 3.3 percent in 1981, and the deficit was \$9.6 billion.

### ***1980 (July–Sept.)–1981 (Apr.–June): Expansion***

In late 1980 American interest rates were increased in response to an unexpected resurgence of economic activity and inflation. This time rates exceeded even their April high. Canadian rates followed American rates to protect the value of the Canadian dollar and to slow the growth of economic activity. In the fourth quarter of 1980 GNP rose at an annual rate of 8 percent compared with negative growth rates in the first two quarters and negligible growth in the third quarter. This was the shortest recovery in the post-Second World War period, and no budgets occurred in this period.

### ***1981 (July–Sept.)–1982 (Oct.–Dec.): Contraction***

Canadian interest rates rose until mid-1981 when the 90-day commercial paper rate reached over 20 percent. A wave of takeovers of foreign firms created huge capital outflows, which put pressure on the exchange rate.<sup>22</sup> Interest rates fell in late 1981, but they began to rise again in the United States in early 1982. A growing interest rate gap and the more favourable inflation progress in the United States caused the exchange rate to fall sharply in late spring and early summer; interest rates were forced up to around 16 percent until the end of the summer when they followed American rates down to approximately 10 percent.

During 1981 and the first half of 1982 *real* interest rates in Canada reached unusually high levels. During most of the 1970s real short-term rates were below 3 percent, while for the 1981–82 period real rates were in the 5 to 7 percent range. Corporate profits fell sharply, industrial and manufacturing production declined, and investment in fixed capital and inventories began to fall. In 1982 GNP fell by 4.4 percent, employment fell by 3.3 percent, and the unemployment rate reached 12.8 percent — a level unprecedented in the postwar period.

One of the indicators of the severity of the 1981–82 recession was that personal expenditure declined by 2.1 percent. This and the reduction in investment caused a major reduction in import demand. Merchandise exports, however, were approximately maintained, creating a huge merchandise trade surplus of \$18 billion and a current account surplus of \$3 billion, the highest since 1970, when the currency was fixed and undervalued.

By mid-1982 the recession also had an impact on prices and wages. Food and energy price increases slowed and the trend in wage settlements was clearly downward. By late 1982 a tentative recovery had commenced.

**Budget — November 1981.** The November 1981 budget was reputed to be a “tax reform” budget. But it generated more resentment, indeed anger, than any budget in recent memory. It also immediately preceded the second sharpest decline in economic activity in the 20th century. As a result, tax reform has not been actively pursued in ensuing budgets.<sup>23</sup>

The view that the November 1981 budget contributed materially to the severity of the 1982 recession is probably mistaken. It is true, with the benefit of hindsight, that the overall tax increase was inappropriate at the time, but it seems unlikely that this was significant. The incentive effects of the changes are also unlikely to have contributed to the decline. The lower marginal rates would have stimulated supply, while the repeal of interest-averaging annuity contract (IAAC) deductibility, and the taxation of interest on accrual would, at the margin, have increased consumption. The business tax changes had mixed macroeconomic effects: the small business proposals would have encouraged retained earnings and hence investment, while the half-year rule, which undoubtedly caused cash-flow problems for some corporations, had a mainly negative effect. Since the deduction was deferred, not eliminated, the cost of capital to corporations affected rose only slightly.

In short, the November 1981 budget likely had only a mildly depressing effect on the economy. Moreover, many changes were postponed and thus did not directly affect the economy. However, to the extent that the budget and its aftermath created a climate of investment uncertainty, the proposed changes (whether in effect or not) may have contributed to the decline. Such effects are easy to postulate but hard to quantify. In retrospect the budget was poorly conceived; it appears that forecasters were fooled by the brevity of the 1980–81 recovery, and even as late as November 1981 had not recognized the “strength” of the downturn.

**Budget — June 1982.** The major new program introduced in the June 1982 budget was the “6 & 5 Program.” Indexation of a number of government programs was limited to 6 percent in 1983 and 5 percent in 1984. These included the personal income tax system, family allow-

ances, and the old age and public service pensions. Pay increases for federal government employees were also limited to 6 and 5 percent. To limit price increases, federal regulatory agencies were requested to limit price increases to 6 and 5 percent, and the provincial governments were asked to take similar actions in areas under their jurisdiction. The private sector was not affected by the program directly, but the finance minister said he hoped it would have some spill-over effects on private sector inflationary expectations and thereby affect prices and wage demands.

Because of the severity of the recession it was thought necessary to allocate some funds to direct job-creation programs (\$500 million) and to aid small businesses (\$500 million). Approximately \$400 million were allocated for housing, and this was expected to create a large number of temporary jobs. The new programs were to be financed through the savings from wage restraint and the limiting of indexation.

Paying for increased expenditures by raising revenues was considered necessary because of the size of the deficit. The forecast deficit for 1982–83 was raised from \$10.5 billion to \$19.5 billion. Table 1-1 shows that a large fraction of the deficit in 1982 was due to cyclical factors (\$9.4 billion). Although the absolute size of the deficit was twice as large as in any previous budget, the structural deficit as a share of GNP was not unusually large compared with that in the second half of the 1970s, and if the total government sector is considered, the structural balance in 1982 was actually in surplus.

### ***1982 (Oct.–Dec.): Recovery***

Recovery from the “Great Recession” started in the last quarter of 1982, and 1983 witnessed strong growth in output and employment, although the unemployment rate remained high, falling only to 11.1 percent by January 1984 from 12.7 percent in January 1983. Happily, the recovery was accompanied by continued moderation in wage and price inflation.

**Budget — April 1983.** The April 1983 budget was prepared in the face of great uncertainty about the strength of the recovery and the desired fiscal stance. The severity of the recession gave rise to a perceived need for substantial stimulus, while the ballooning federal deficit was perceived as severely limiting the government’s room to manoeuvre.

The response to this was “operation tilt” — an intertemporally balanced budget whereby stimulus was provided immediately but offset with later tax increases and other measures to ensure that the structural deficit did not grow. Specific measures included some public work expenditures, extension of the provisions for loss carry-backs for corporations (thus providing temporary tax cuts and alleviating cash-flow problems), and extension of the cap on indexation of the Personal Income Tax.

**Budget — February 1984.** This budget pretty much maintained the status quo. Basically, it honoured the medium-term commitment of the previous budget and tabled some proposals for structural improvement. Major changes were also introduced in the tax treatment of retirement savings, in effect moving the personal tax system further away from an income base and towards an expenditure base.

## **The Performance of Fiscal Policy**

In this section we offer a preliminary judgment of the performance of fiscal policy in the Canadian economy over the 1963–84 period. The 1960s witnessed surprisingly strong and continuous growth; indeed, growth was almost always stronger than the various budget documents anticipated. Macroeconomic policy was generally a passive force in this growth and neither created nor reacted to cyclical swings in any substantial way. Partly as a result of the tendency to underestimate the strength of the economy, there was a systematic tendency for excessive fiscal expansion, especially toward the middle of the decade.<sup>24</sup>

Expansion in this period was reflected in a series of tax cuts, in the rapid expansion of the provincial-local government sector, and in the expansion of some key social programs. This fiscal expansion played a role in the overheating of the economy and the increase in inflation that led to the policy restraint and the induced downturn in the economy that occurred at the end of the decade.

The major cyclical event of the decade was the temporary slowdown in early 1967. The government's reaction was to introduce fairly sharp fiscal stimulus which was reversed later in the year when it was perceived that the slowdown was so minor. This provided an early example of the stop-go policy that became more common in the 1970s.

Following that brief but nevertheless sharp downturn, the 1970s started with a strong economic boom. In 1970 the macroeconomic stance was reversed, and both monetary and fiscal policies fuelled demand in 1970–72. (For a detailed discussion of monetary policy over this period, see Courchene, 1976 and Sparks, 1985.) A large number of economists have argued that this policy reversal resulted in the squandering of the disinflationary gains that had just been made in the 1968–70 period of restraint. This stop-go episode was considerably more marked than that which occurred in 1967, and was less easy to justify since the downturn of 1970 had been policy induced.

The performance of fiscal policy over the 1972–74 period is more difficult to assess. The rhetoric of the budgets over this period was strongly expansionary. The actual deficit grew in 1972, but surpluses emerged in the next two years. On a cyclically adjusted basis deficits remained, although these were swamped by the inflation adjustment. To the extent that the inflation adjustment accurately reflected a non-expansionary component of the deficit in this period, fiscal policy was

not expansionary. However, the rapid increases in inflation may not have been fully anticipated, so that the expansionary impact of fiscal policy may be underestimated by the structural deficit as measured in Table 1-1. Further, the budgets of the period were dominated by supply-side measures, which may distort the deficit as a measure of demand.

There is little doubt that fiscal policy turned sharply expansionary in 1974–75, just as the OPEC shock hit. There was a dramatic \$5 billion increase in the deficit, which was also reflected in large cyclically adjusted deficits.

Despite the official designation of the 1975–79 period as one of growth and expansion, there was a disturbing trend of continued and indeed increasing unemployment and deficits. Looking back at Table 1-1, we see that the federal budget was in deficit, by any measure, virtually every year after 1975. Further, the cyclically adjusted and structural deficits rose to record levels as a percentage of GNP in that period.<sup>25</sup> As Bruce and Purvis (1983b) have argued, this fiscal expansion was counter-productive to the espoused goal of disinflation, and especially to the policy of gradual monetary restraint being pursued by the Bank of Canada. These deficits also contributed to the growth in the real stock of government debt that raised serious policy issues and constrained the ability of the federal government to act in ensuing years.

Economic performance over the 1980–84 period was poor by any standards; the downturn of early 1980 turned into the recession of 1982 with only a brief interruption from 1980 (Apr.–June) to 1981 (Apr.–June). Much of the recession was policy induced, although unexpected fiscal restraint was introduced by the tax reform component and forecasting errors in the November 1981 budget.

Such restraint as did occur was not reflected in the deficit, as actual and structural deficits remained large. The April 1983 budget addressed the problem of poor performance and high structural deficits by introducing a “tilt” to the expected deficit pattern; the extent to which this will be effective remains to be seen.

At the aggregate level, we can thus identify some tendency to “cumulative error,” as the budget balance clearly shows a marked and disturbing trend towards deficit, however measured. There is much less evidence of destabilizing policy reversals. Although reversals did occur and some cyclical phases were policy induced, dramatic changes in the aggregate demand stance, in the manner of the British stop-go policies of the 1960s, are not evident. However, this is one area where the “summary statistic” nature of the deficit hides considerable policy instability at the microeconomic level.

### *The Budget Process and the Need for “Rules Stability”*

The budget document has gradually become the vehicle for a whole host of policies other than macroeconomic stabilization. Up to now our

discussion has focussed on the stabilization issues, but the survey of the budgets nevertheless reveals that an astonishing array of policy measures has been introduced. It is hard to make much sense out of this overall pattern or give any perspective to it other than that of “excessive interventionism.”

Budgets have become the vehicle for social policy, regional policy, industrial policy, gender and youth policy, structural policy, and re-election policy. The tax system has been used and twisted in a variety of ways to pursue these goals and has suffered considerably under the pressures. Indeed, one gets the strong impression that too much is demanded of the tax system in this country.

This excessive interventionism has also created a certain amount of scepticism and cynicism towards federal budgets. The extensive and frequent “tinkering” encourages the impression that the tax-transfer system is the “personal plaything of the federal cabinet” which it uses, apparently with little justification, to pursue its own political objectives and to reward various favoured special interest groups. This is exactly the wrong set of incentives to create; instead, what is needed is some commitment to maintaining “rules stability.”<sup>26</sup>

International evidence suggests that most economies appear quite resilient and able to perform relatively well under a wide range of “policy rules.” Frequent changes of policy rules — particularly reversals — create uncertainties for decision makers that are harmful to economic performance.

The excessive activism that has increasingly characterized federal budgets has contributed to a growing sense of rules instability. One policy flip-flop renders uneconomic a whole host of previous decisions and plans under the previous set of rules. A sequence of policy flips means that not only are past decisions rendered less beneficial, but that an atmosphere where the new rules lack credibility is created; hence decision makers will not respond fully to the new set of rules.

Thus leadership and stability in economic policy are often more important than the specifics of the policies themselves. Of course, policy mistakes must be corrected: we do not argue for blind stubbornness. What is called for, however, is caution in making new policies so as to avoid the policy flip-flops that arise when frequent reversals are required to correct the mistakes of ill-considered previous policies.<sup>27</sup> Some case studies are illustrative.

### *The 1973–74 Budgets: A Case Study*

The budgets in May and November 1974 had a number of interesting features that warrant further discussion. These include the implications of indexation, the impact of the supply-side measures involved, and the appropriateness of the amount and type of stimulus introduced.

**Indexation.** While the indexing arrangements introduced in 1973 were well received, and although most economists would agree that it is desirable to adjust the government's tax and expenditure systems to take account of inflation, it was probably true that the misleading impression had been created that indexing could neutralize the effects of inflation caused by relative price changes. The fact that the OPEC price increase of 1973 meant that the non-energy-producing sectors of the Canadian economy would eventually have to absorb a real-income loss was not widely recognized. Failure to realize this may have contributed to expectations on the part of the public (in matters such as wage bargaining) that could not be fulfilled, and such expectations may have contributed to the real-wage inertia and loss of competitiveness that characterized the Canadian economy over the next few years.

**Supply Side.** However desirable the long-run effects of supply-side measures, they seemed destined to failure as a short-run anti-inflation policy. As more recent U.S. experience has also shown, the demand effects of these policies tend to dominate the supply effects in the short run. Further, since many Canadian prices are determined in international markets, some supply-side measures lead only to offsetting changes in markups.

**Stimulus.** In 1974 the recession in the United States led to lower Canadian exports. The government responded by cutting taxes. As a result, private expenditure, including that on imports, was maintained; this led to a deterioration in the current account. Spending on non-traded goods was also sustained, causing wages to rise in that sector, especially for public servants.

### ***Tax Reform: A Case Study***

Tax reform is an issue that will likely remain on the political agenda, so it is useful to examine the response to the November 1981 budget. Tax reform inevitably generates some negative sentiment, but several features of the November 1981 budget and its preparation and presentation aggravated the situation.

- The failure to consult with tax experts outside of the Department of Finance left the merits of the Department's case unsupported; most "tax experts" saw the proposals for the first time on budget night.
- Tax reforms were combined with an overall *increase* in tax revenues. As a result, credibility was lent to the cynical view that the budget was just a "tax rip-off" designed to grab revenues for the government rather than to achieve the objectives of tax reform. Also, the tax increase implied that there were only tax reform "losers" rather than "gainers."

- Some of the changes were complicated and/or their purpose poorly explained. Furthermore, once the back-tracking process began, the budget proposals injected considerable difficulty and uncertainty into private tax planning.
- Some proposals had retroactive elements, while others gave the impression of pettiness (e.g., raising standby charges on personal use of the company car). This generated negative public sentiment disproportionate to the actual magnitude of the increased tax liabilities.
- In the same vein, many of the tax changes were labelled “plugging loopholes” with the obvious implication that those taxpayers who had been taking advantage of them were somehow venal. This invited the reaction that “today’s loopholes are yesterday’s incentives” and “why are we being retroactively taxed for responding to tax incentives installed a few years earlier?”

### *Demand Management and Prudence: A Case Study*

In April 1983 the dual roles of the federal budget, in terms of demand management on the one hand and the growing stock of federal debt on the other, were perceived to be in sharp conflict. The deficit stood at over \$25 billion, roughly one-fifth of the *total* stock of debt outstanding; but the economy was only slowly emerging from the worst recession since the Second World War.

There was a GNP gap in the order of \$40 billion, but only \$2 billion in stimulus was provided for 1983–84. This is partly explained by expectations of strong automatic recovery, but it is also partly due to concern about the deficit. Further, the stimulus that was provided was to be gradually eliminated by future tax increases; there was a “tilt” to the projected budget deficits. The budget was an exercise in *confidence*, and that *confidence* issue is at the heart of the tilt to the projected deficits. The tilt was meant to assuage the fears in the capital markets about the growing national debt. The budget essentially proposed a balanced change in expenditure and revenue over two to three years. The important questions are: Will the future tax increases be forthcoming? How will capital markets react if they are not? How will such events affect future policy and future policy effectiveness? What if the recovery is weaker than projected? Then tax cuts are appropriate but may not be desirable in light of the government’s commitment to the tilt. Has the groundwork been laid for such uncertainty, or will we end up pursuing “bad policy” to maintain credibility?

Credibility is a difficult issue in the theory of policy. In bargaining theory and game theory, credibility is established by setting up “self-imposed” penalties for defaulting on a commitment. One might ask whether this is a fruitful line of inquiry for fiscal policy. One area where it may be is in the design of fiscal systems. Does the Canadian system

undermine or reinforce credibility? What features are important? The frequent cabinet shuffles that have become part of the scene seem to reduce credibility, as does the perception of continual “tinkering” with the tax system.

### *Automatic and Discretionary Stabilization*

There are strong automatic stabilizers in place in the Canadian economy, although their strength and role have changed. The revenue elasticity of the tax system has been systematically reduced over the period under consideration because of some tax cuts and indexation of the tax system, as well as a decreased role of the corporation income tax. However, the effect of these changes on the automatic stabilizers has been to some extent offset by the increased income dependency of transfers and expenditure taxes.

Many commentators have suggested that the size of the fiscal policy multipliers has shrunk over the period, partly as a result of the move to flexible exchange rates. From a stabilization viewpoint, this suggests we should move toward increased reliance on automatic stabilizers and a decreased reliance on discretionary policies.<sup>28</sup>

Nevertheless, discretionary policies have been used a great deal. As we noted above, McCallum suggests that on balance they have been stabilizing. However, his analysis is subject to the “Lucas critique” (Lucas, 1976), which suggests his results may be biased. McCallum’s conclusion is based on a counterfactual where the model is simulated to examine the path of output under the assumptions of using rules only *and* that behaviour would be the same in the two scenarios. The last assumption is questionable, especially in light of active use of short-term tax breaks to stimulate investment.

For example, suppose the economy enters a recession, and investment falls. Government becomes concerned about the low investment, and in its budget it brings in some tax incentives geared to investment expenditure. As a result, investment rises, bringing about a recovery; the discretionary fiscal policy is clearly successful. The only problem with this policy is that it is a game that the other players will learn to play too.

Now suppose that a similar episode occurs a couple of years later. In this case the private sector anticipates the future discretionary tax break as investment and output fall. As a result, investment falls even more, for why invest now if you anticipate that the government will introduce tax cuts in an upcoming budget? The recession prior to the budget is worse, but when the budget is introduced the recovery in investment is stronger than ever. Not only is some new investment induced, but the investment deferred in anticipation of the budget comes on line.

An analyst who treats the entire initial fall in investment as exogenous, and the entire subsequent rise as induced, will conclude that the discre-

tionary policy was highly successful. Yet by inducing a deferral of investment the policy actually exacerbated the cyclical swing in the economy.

The foregoing suggests the difficulty of reaching a final assessment of the role of discretionary policy. Once expectations are taken into account, such policies can behave rather differently from what conventional analysis suggests. Generally, the more such policies are anticipated, the less efficacious they become. While any final assessment may be some time in coming, it is nevertheless clear that this argument is one in favour of more limited use of discretionary policy.

## Conclusions

In drawing some brief conclusions it is useful to return to some of the themes raised in the conclusions to Will's study completed twenty years ago.

The first barrier to effective fiscal policy that Will identified was the tendency "to view countercyclical fiscal policy in terms of budgetary surpluses and deficits rather than in terms of the discretionary changes in fiscal policy." Since then, considerable progress has been made toward gaining acceptance for the "structural deficit" as a measure of discretionary changes. The cyclical adjustment is widely accepted in principle, although there is still considerable disagreement over how the adjustment should be calculated. The inflation adjustment is still controversial but is gaining in acceptance.<sup>29</sup>

The second barrier to fiscal effectiveness identified by Will arises from *political* considerations. Here he mentions the deficit again and briefly alludes to the political business cycle. But he focusses on the implications of the government's assuming responsibility for maintaining full employment. Will sees the natural tendency of governments to pursue expansionary policy being more than outweighed by the government's unwillingness to admit to any serious economic problems. While this assessment may have made sense in light of the government's tendency to overestimate economic performance in the 1950s, it seems less applicable to the period under consideration in this study. The 1960s and 1970s both witnessed a tendency to underestimate economic performance and pursue expansionary policy excessively. If nothing else, this is testimony to the public acceptance of the government's role in stabilization.

The third factor Will raises is the need for "fiscal flexibility." He focusses on the role of the "public works shelf," which has since become increasingly a provincial-municipal rather than a federal policy area. However, the increasing number of commitments to program expenditures hinders flexibility of federal fiscal actions, which would pose a problem for those wishing to encourage active discretionary policy.<sup>30</sup> In light of the above arguments about the viability of discretionary policy, more appropriate concerns would be the role that program expenditures

play in automatic stabilization over the cycle and their implications for projected deficits over the medium term.

## Notes

This study was completed in December 1984.

We would like to thank members of the Macroeconomics Research Advisory Group — in particular John Sargent, John McCallum, and two anonymous referees — for many helpful comments.

1. From a macroeconomic perspective, views about the importance of the deficit vary considerably. The extreme Barro-Ricardo view holds that only government absorption of goods and services matter, and that since debt and tax finance are “perfect substitutes,” the deficit itself is an irrelevant accounting fiction. The Sargent-Wallace view goes further to suggest that money and debt finance are also substitutes, so it is irrelevant whether debt is monetized now or later.

The role of the deficit for short-term stabilization purposes must be balanced against its long-term implications for the accumulation of the national debt. These longer-term issues, and their implications for the conventional adjustments to the measured deficit, are taken up in the following Commission study, by Bruce and Purvis (1985).

2. A third adjustment, widely accepted in principle but seldom applied in practice, is to weight the various components of the deficit to account for their differential effects. The problem in implementing this procedure is that “multipliers” for the various components must be agreed upon in order to construct the weights, and such agreement is not readily obtained. However, the procedure of not-weighting amounts to implicit agreement that all the weights are the same; a procedure that we *know* is wrong. In the face of rapidly changing deficits and rapidly changing expenditure-transfer mixes, this procedure seems highly questionable.
3. Note the difference between the two adjustments. The cyclical adjustment eliminates the part of the deficit relating to the operation of automatic stabilizers; the inflation adjustment eliminates the part of the deficit for which there is no stabilization effect if households indeed do save the entire inflation component.
4. Note that we use the term “structural deficit” to include the deficit adjusted for *both* the cycle and the inflation rate. We reserve the term “cyclically adjusted deficit or surplus” for the deficit adjusted only for the cycle. As can be seen in the tables, the inflation adjustment is not available prior to 1970; hence, for the 1963–70 period we consider fiscal policy only in terms of the cyclically adjusted deficit.
5. Tables 1-3 and 1-4 include the Canada and Quebec Pensions Plans. Provincial and local government budgets are usually considered together since the municipalities are under provincial jurisdiction and because the provinces have delegated varying degrees of power and responsibility to their municipalities.
6. For supporting evidence, see for example Curtis and Kitchen (1975). Fortin (1982a; 1982b) provides some contrary evidence.
7. Data problems make it very difficult to determine the size of import leakages between provinces, but studies by Cox (1981), Zuker (1976) and Auld (1978) suggest they are large, especially for the smaller provinces. However, Wilson (1977) found that Ontario provincial multipliers were “not trivial,” and Fortin (1982b) found the size of fiscal policy multipliers for the three largest provinces were over 75 percent of the federal multipliers.
8. For a fuller discussion of these modelling issues, see the Commission study on monetary policy by Gordon R. Sparks (1985). The Commission study by Bruce and Purvis (1985) focuses on the impact of fiscal policy on long-run potential output (via the “burden of the debt”) in contrast to the short-run focus of this study. Both studies follow in volume 21.
9. Domestic real absorption will influence the long-run real exchange rate and thus may give rise to long-run domestic supply effects. As Purvis (1983) argues, this will alter exchange rate expectations, the interest rate, and hence current output.

10. McCallum (1983) employs a simple weighting procedure to deal with the issues discussed in note 2 above. He also eschews the Department of Finance cyclical adjustment procedure and develops his own.
11. The discrepancy with Table 1-1 arises because the budget papers typically report the budget balance on a fiscal-year basis, while Table 1-1 is presented on a calendar-year basis. Similar discrepancies crop up in later discussions.
12. Fortin and Newton (1982) estimated that the Canadian natural rate of unemployment (which they defined as the non-accelerating inflation rate of unemployment, NAIRU) rose steadily from just over 4.5 percent in 1965 to over 6 percent by 1972. In a separate study, Reid and Meltz (1979) argued that structural and frictional unemployment rose by about 3 percentage points from the mid-1960s to the mid-1970s. They cite these main causes:
  - (i) the continuing shift from agricultural to non-agricultural employment contributed approximately 0.2 percentage points;
  - (ii) the 1971 change in the Unemployment Insurance Act contributed about 1.9 percentage points of which 0.7 percentage points resulted from the higher benefit-wage ratio and 1.2 percentage points from revisions in the regulations of the Act;
  - (iii) demographic changes contributed about 1.2 percentage points by increasing structural unemployment. The demographic changes resulted partly from exogenous factors such as the increased fraction of youth in the population and partly by other factors such as changes in the Unemployment Insurance Act and changing social attitudes.

In its 1977 budget papers, the Ontario government also raised its estimate of the natural rate of unemployment by 2.5 percentage points.
13. Reid and Meltz (1979) go on to argue: "One important policy implication of our analysis is that the 1971 revision of the U.I. Act substantially changed the meaning of the unemployment rate as an indicator of excess demand in the labor market between the mid-1960s and mid-1970s, with the result that a higher target rate of unemployment for monetary and fiscal policy is appropriate. . . ."
14. The expansionary provincial policies were encouraged by the federal government. See John Turner, in Canada, House of Commons, *Debates, Budget Speech*, February 19, 1973, pp. 1435–36. In Ontario a small deficit of \$48 million in 1970 was turned into a \$362-million deficit in 1971, three times as large as any Ontario deficit over the previous ten years. Ontario's fiscal policy was again expansionary in 1972 and by 1973 output in Ontario was exceeding potential. (See Frank Miller, in Ontario, Legislative Assembly, *Budget Speech*, Budget Paper B, April 10, 1979, pp. 5–9.) In 1973 the deficit was reduced to \$282 million. According to the budget speech (p. 33), this was in order to maintain the provinces' credit rating.
15. The fact that the 1974–75 recession was less severe in Canada than in other industrialized countries likely contributed to higher wages and the marked decline in Canada's competitive position between 1974 and 1976. (Canada, Department of Finance, 1980, p. 98.)
16. The inflation adjustment is made using actual inflation rates. In a period of rising inflation such as the early 1970s, the actual inflation rate may exceed the expected inflation rate. Accordingly, the structural balance may well underestimate the strength of fiscal policy.
17. Many of the expansionary policies had been suggested by the New Democratic Party, whose support the minority government required in order to get the measures through Parliament.
18. See OECD, *Economic Surveys, Canada* (January 1981), p. 33. The use of energy reflects both high consumption and the fact that Canada produces and exports such energy-intensive goods as newsprint and aluminum.
19. Although the unemployment rate was relatively steady at approximately 8 percent, the growth rate of total employment remained fairly strong, averaging 3.1 percent per year between 1977 and 1979.
20. The credit was to be in effect until July 1977, but in 1977 its coverage was expanded and renewed for three more years. In 1978 the rate was again increased and the deduction was extended indefinitely.

21. This is the famous episode that occurred shortly after Prime Minister Trudeau attended the Bonn Summit where his views were reported to have dramatically changed during an afternoon sail with West German Chancellor Helmut Schmidt.
22. The capital outflows have been attributed to the taxes on foreign capital introduced as part of the National Energy Program.
23. In the November 1981 budget, 100 tax preferences were identified, and the philosophy of eliminating tax expenditures in order to lower tax rates and achieve horizontal equity was publicly endorsed. Most of the tax changes proposed fell into the first class — broadening the tax base, particularly the Personal Income Tax (PIT) and lowering marginal tax rates. Some comments on the tax reform process provoked by the November 1981 budget are included later.
24. This is in contrast to the experience of the 1950s as documented by Will (1967), where the tendency was to overestimate the strength of the economy and hence bias fiscal policy towards restraint; in particular, towards a balanced budget.  
Fiscal policy in 1966 and 1967 was not as stringent as the budget speeches seemed to indicate, in part because of a number of structural changes. Financing for the new social security program was costly, revenues were affected by the 3 percent income tax abatement to the provinces, public service wages increased substantially, and funding was required for projects related to Expo 67.
25. One of the features of this period was an increased use of tax cuts, rather than expenditure increases, to stimulate the economy. Since tax reductions are usually thought to yield less “bang for the buck” than government expenditures, and because they were generally not matched by equivalent expenditure reductions, these tax cuts contributed to the growth of the deficit.
26. There is an analogy to the way that the theory of microeconomic policy has evolved over the last 25 years. Microeconomists started with the market as an ideal. As various market imperfections were identified, economists initially accepted them as a *prima facie* argument for government intervention. If the market were imperfect, the “wedges” that arose could be examined, and a government policy that — in principle — eliminated the imperfection, could be devised.  
However, experience with microeconomic policies has been that, very often, the policies go wrong — that while the market was imperfect, government policy also turned out to be imperfect. Modern microeconomics involves comparing market imperfections with policy imperfections. It would be healthy if macroeconomists were to conduct more of their debates in this same sort of manner, and if more justification were required for changes in the policy stance.
27. This issue of rules stability is taken up in the comments by Chris Higgins and by Douglas Purvis in the Commission’s symposium on foreign macroeconomic experience. (See Sargent, 1985.)
28. This argument in favour of automatic relative to discretionary stabilization applies even more strongly to the provinces.
29. The structural deficit has recently come under attack in the face of the explosion in actual deficits over the past few years. That controversy, however, confuses fiscal stabilization — for which the structural deficit is the appropriate measure — with fiscal prudence, taken up in Bruce and Purvis (1983a; 1983b).
30. Some elements of the “fiscal reform” recently introduced in British Columbia have addressed this perceived need to reduce commitments to program expenditures.

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# Consequences of Government Budget Deficits

NEIL BRUCE

DOUGLAS D. PURVIS

## Introduction

In this study we attempt to put into perspective the major concerns about the government deficit, many of which have been widely voiced. We concentrate on two central roles that the deficit plays in the economy: it influences the short-term cyclical fluctuations that the economy experiences, and it influences the size of the national debt with consequent implications for the long-run performance of the economy.

Two extreme views on the deficit can be identified by the stress given to these roles: Neo-Keynesians focus almost exclusively on the short-term stabilization aspects of the deficit and tend to dismiss concern about the level of the debt, while neo-conservatives focus almost exclusively on the perceived costs of growth in the national debt and are willing to forego any stabilization benefits to ensure that the debt is controlled.<sup>1</sup>

In both of these extreme views, the deficit matters for the economy. However, it is possible to identify a set of conditions which would mean that neither the deficit nor the debt would matter in the economy. In such a world deficits merely represent postponed taxes, and future taxes are viewed as equivalent to present taxes. Accordingly the deficit plays no role in stabilizing the economy, and the cumulative debt imposes no burden on the economy.

As we argue in some detail in the next section, there are good reasons for believing that the conditions under which this “debt neutrality” proposition holds are not in fact met in the real world, and that deficits and the debt do in fact matter. An important implication emphasized in this study is that it is largely one feature of the economy — the ability of deficits to influence

aggregate saving — which gives rise to *both* roles of the deficit noted in our opening paragraph. Hence any reasonable discussion of deficits must consider both short-run and long-run consequences.

The deficit of course is merely one summary statistic used to describe the government's wide range of activities; its appropriateness as a summary statistic depends on what purpose it is used for. Consequently we give considerable attention to both conceptual and measurement issues. One limiting feature of the deficit as a summary statistic that warrants mention at the outset is that it is by convention an annual measure. Yet many of the concerns that we address involve periods longer than a year. Hence we will often talk of the government's "fiscal plan." The government's fiscal plan is a projected expenditure and revenue structure for current and future years reported in each budget; it gives not only the medium-term fiscal strategy but also an official forecast for key economic variables.

In the next section we discuss a number of central issues that arise in measuring the government deficit and the public debt, and we then present the relevant historical series for Canada. In the third section we discuss the role that the deficit plays in the economy; there we develop in some detail both the short-run stabilization role and the long-term implications of deficits and then elaborate on the relationship between these two roles. Using this analysis of the deficit and the economy as background, we go on in the fourth section to address the issue of evaluating the deficit. In the fifth section we assess current and projected Canadian government deficits from the perspective of both policy objectives. The final section presents some conclusions. The appendix contains a formal representation of a number of the central ideas in the paper.

## **Measuring Government Debt and Deficits**

### ***Definitions of the Deficit***

The public deficit is the excess of government expenditures over government receipts. There are several accounting measures of the public deficit including the National Income Accounts (NIA), the Public Accounts (PA), and the Financial Requirements (FR) measures.<sup>2</sup> These differ in what they include and exclude from receipts and expenditures. Also, any of them may be reported on a calendar year or fiscal year basis.

The NIA deficit is intended to measure the impact of the public sector on the demand for goods and services in the economy. Actually, it is inadequate for this purpose and must be adjusted for inflation as discussed below. The NIA deficit can be measured for the federal government alone or for the consolidated public sector including provincial governments (and hospitals) and municipal governments; for reasons

that are made clear below, we devote most of our attention to the federal government deficit.

The PA measure of the deficit (the one most commonly quoted in budget speeches and press accounts) is intended to provide Parliament with financial control over the government's transactions. It excludes receipts and expenditures on non-budgetary items such as loans and advances. It also excludes transactions on specified purpose accounts such as the Unemployment Insurance (UI) account, the Canada Pension Plan (CPP), and Public Employee Superannuation accounts. Receipts on these excluded non-budgetary transactions have far exceeded outlays in the past and will continue to do so over the next decade; as a result, the PA deficit is considerably larger than the NIA deficit.

A digression on the issue of the accruing liabilities of unfunded public pension benefits is warranted. Some economists (e.g., J. Bossons and P. Dungan) have argued that the surpluses on the CPP/QPP and superannuation funds — a major component of the difference between the PA and NIA deficits — should be excluded in calculating the deficit because they are more than matched by accruing liabilities in the form of commitments to pay pension benefits in the future. By this logic, transactions on a fully funded pension plan would be ignored in calculating the deficit while a large negative item must be imputed for unfunded pension plans.

While accounting for accruing liabilities on all such "entitlement" programs is certainly useful, we believe that it is not desirable to exclude the measured surplus or deficit on these accounts from the measured government budget balance. Such a procedure would create a serious asymmetry in the treatment of retirement saving done through private and public channels. For example, suppose that private saving is exactly replaced with a fully funded public pension plan. If the government deficit excluded the current surplus on this fund, total domestic saving (private plus public) would fall even though nothing real has changed. Similarly, the replacement of private pension saving by an unfunded pension plan (which would actually be a pure transfer scheme) would result in domestic saving falling both from any reduced private saving and from the accruing pension liabilities of the program.

For this reason, we believe that for most purposes it is best to consolidate only the current surplus or deficit on off-budget items (such as the CPP/QPP and public employees' superannuation) directly into the federal deficit measure, as is done under NIA accounting procedures. For government planning purposes, forecasts of future receipts and payments on these funds extending beyond the medium-term horizon of the fiscal plan should be, and are, made.

When the net deficit (currently negative) on non-budgetary transactions is added to the PA deficit we get the FR deficit which is equal to the amount the government must actually borrow by selling bonds to the public or the Bank of Canada. The FR deficit is approximately equal to

the NIA deficit; the main difference between them is that the NIA deficit measures some items on an accruals rather than a cash flow basis. Also, the gross receipts and expenditures as measured by the FR basis are much smaller than the corresponding NIA measures because numerous items are netted out.

The PA measure is the least appropriate for evaluating the economic policy issues surrounding the deficit. The FR measure, although important because it measures the flow of government liabilities into the economy, is roughly equal to the NIA measure. Consequently, we will be concerned almost exclusively with the NIA measure.

## *Deficits and the National Debt*

The deficit measures the *flow* of government expenditures in excess of tax revenues or, equivalently, the flow of government liabilities into the economy. There are corresponding measures of the *stock* of government debt which accumulates as a result of past deficits. As in the case of the deficit, there are several measures of the stock of government debt. Two such measures, which are important in understanding the policy issues surrounding the deficit, are the stock of net fixed-value government liabilities (NFVL) and the stock of interest-bearing government bonds held outside the Bank of Canada (denoted B).

The NFVL is equal to total government liabilities less fixed-value assets held by the government. A fixed-value asset or liability has a principal that is fixed in terms of dollars, as opposed to a “real” asset such as equity shares. Consequently, as the price level rises the real value of a fixed-value asset declines. This is important in adjusting the deficit for inflation as discussed below. The stock of interest-bearing government bonds held outside the government and its agencies is important because, along with the interest rate, this stock determines the interest payments that must be made on the government debt; i.e., it determines the size of the debt service account. To service this debt, tax revenues must be raised or expenditures on government services reduced.

There is no simple relationship between either of these stock measures and the accumulated (NIA or FR) deficits in the past. In general, the NFVL stock is smaller than the accumulated deficits because government holdings of variable-value assets are not subtracted from government liabilities in calculating NFVL. The B stock is also smaller than accumulated NIA deficits because the stock of non-interest-bearing (or monetary) liabilities of the government is not included. For simplicity, we shall assume the NIA and FR deficits are equal (and simply refer to “the deficit”) and that the NFVL stock is equal to the accumulated past deficits. Also, we will assume that, for the federal government, the NFVL stock is equal to B (the interest-bearing government debt) plus the monetary base or high-powered money (denoted H). This is not exactly

correct but does not do violence to the accounting relationships summarized therein.

### *Adjusting for Inflation-Induced Measurement Errors*

The purpose of the NIA measure of the deficit is to report the net contribution of the government sector to the total demand for goods and services. As mentioned above, the conventional NIA deficit measure suffers from a bias due to inflation. The reason is that the government sector is a net debtor in the economy and its liabilities are of the fixed-value type. A rise in the price level reduces the real value (i.e., the purchasing power) of those liabilities and, correspondingly, the real wealth of the private sector. However, this inflation-induced withdrawal of purchasing power from the private sector, which is equivalent to a tax, is not captured by the conventional NIA deficit measure. Consequently, it is appropriate, and increasingly common, to report the inflation-adjusted NIA deficit. This measure is obtained by subtracting from the conventionally measured NIA deficit an amount equal to the outstanding stock of NFVL of the government times the inflation rate over the measurement period. This inflation-adjusted NIA deficit is a more accurate measure of the net contribution of the public sector to the total demand for goods and services in the economy.<sup>3</sup>

It should be stressed that this inflation adjustment is to correct a measurement problem. It is sometimes asserted, incorrectly, that the inflation-adjusted deficit is the deficit that would occur in the hypothetical absence of inflation. This is wrong. Some taxes and expenditures (such as debt service costs) would be altered in the absence of inflation in ways that are not properly captured by the inflation adjustment. Thus it is incorrect, as well as undesirable in our view, to interpret the inflation-adjusted deficit as a hypothetical deficit in this way.

Except for the minor accounting problems considered above, the accumulation of the inflation-adjusted deficits of the past is equal to the real value of the government debt as measured by the NFVL deflated by a price index. A positive inflation-adjusted deficit means that the real government debt is growing. The real debt might be growing more slowly or quickly than output (real GNP), and thus the debt-to-GNP ratio might be falling or rising, depending on whether the inflation-adjusted deficit is greater or smaller than the output growth rate times the real stock of debt.

### *The Government Budget Constraint*

The government budget constraint requires that receipts equal outlays. It can be expressed for any unit of time, and two important concepts it involves are the flow budget constraint and the inter-temporal budget constraint.

The flow budget constraint of the government is defined for a par-

ticular time interval such as a year. It simply states that, for the year, the excess of government expenditures on goods and services, transfer payments, and interest payments on the government debt over tax and non-tax revenues must equal the value of new government bonds issued during the year. These bonds are sold to the private sector and/or, in the case of the federal government, to the Bank of Canada which issues non-interest-bearing (monetary) liabilities of an equal amount. Thus the federal government deficit equals the increase in interest-bearing government debt plus the increase in the monetary base. Unless offset in other ways, the increase in the monetary base results in an increase in the nation's money supply. To the extent that this occurs, the government is said to be monetizing the deficit or "resorting to the printing press."

The inter-temporal budget constraint is more difficult to explain and express.<sup>4</sup> Consider first the inter-temporal constraint of a household, which can be expressed in terms of balancing the flows of expenditures and receipts over the household's lifetime. For the household, the inter-temporal budget constraint requires that the present value of its expenditures over its lifetime equal the present value of its receipts.<sup>5</sup> This constraint states that, if a household spends (say) a dollar in excess of receipts in one year (i.e., it runs a deficit), this must be balanced by receipts in excess of expenditures in another period. In particular, receipts must exceed expenditure by one dollar plus interest (if the repayment comes in the future) or by one dollar less interest (if the repayment were saved earlier). In sum, the household's saving and dis-saving (borrowing) must balance out over the household's lifetime, inclusive of interest.

Unlike the household, the state is an "immortal" institution with no natural lifetime over which its expenditures and receipts must balance.<sup>6</sup> Thus the government can issue debt in perpetuity so that the principal is never paid off. Nevertheless, the government still faces an inter-temporal budget constraint that prevents it from unlimited borrowing. If the government runs a deficit in an inflationary economy and spends a dollar in excess of tax receipts in one year, it must pay interest on that debt in perpetuity (or until the debt is retired). Therefore in the future it must either raise more taxes or spend less on non-interest items (i.e., government services and transfers) than its revenues by the amount that is required to pay the interest on the increased debt. In an economy that is growing at annual rate of  $n$  percent, the government can issue new debt to service the incremental bonds at a rate of  $n$  percent per year, and taxes must be raised or expenditure reduced at a rate of  $(r-n)$  percent per year.<sup>7</sup>

This leads to an important constraint on government debt issue. If the government debt grows faster than its receipts, the interest payments required to service the debt also grow faster than its receipts. This cannot continue indefinitely. In the absence of ever-increasing tax rates,

government receipts cannot grow faster than the tax base. In general the tax base does not grow faster than nominal income, which grows at a rate equal to the sum of the long-run trend growth rate in output and the long-run inflation rate. This provides the upper bound for the long-run growth rate in government debt.

An alternative way of expressing this constraint is that government spending on non-interest items less taxes cannot exceed the government debt times the difference between the long-run growth rate and the real interest rate in the economy, unless the government resorts to ever more rapid growth in non-interest-bearing (monetary) debt.<sup>8</sup> This would lead to accelerating inflation ending in a hyper-inflation.

It should be stressed that the above represents a feasibility constraint on the rate of growth in government debt and not a desirable path for it. There are an infinite number of time paths for the government debt permitted by this constraint, and all the paths possess the property that the growth in the debt service charges do not outrun the growth in government receipts over the long run. Choosing among these paths (i.e., choosing a deficit policy) is an important issue which will be discussed in the sections on evaluating deficit policies and the Canadian federal deficit.

The main implication of the government budget constraint for policy issues is the recognition that deficits today require reduced government services and transfers or higher taxes in the future when  $r > n$ . This simple point is sometimes overlooked in debates over deficit policy. For example, the costs of deficit cuts in terms of higher taxes and lower government services are often stressed as a reason not to cut the deficit. In fact, such costs are deferred, not avoided, by deficit finance. In some cases deferring costs in this way is good policy, in other cases it is bad policy.

### *The Public Deficit and Debt in Canada Since 1970*

Table 2-1 presents the basic facts surrounding the evolution of the federal government deficit (on an NIA calendar year basis) since 1970; Table 2-2 presents the same facts on a consolidated governments basis. Columns 1 and 2 show nominal revenue and expenditure respectively, while column 3 shows their difference — that difference being the NIA deficit. A quick glance at column 3 reveals the source of a lot of the recent concern over government deficits in Canada; that column shows a marked trend towards increased deficits. Between 1970 and 1975 the NIA budget for the federal government was roughly balanced and was in surplus for the consolidated government sector. Between 1975 and 1981 the NIA federal and consolidated budgets were continually in deficit; the federal deficit reached a high of \$10.6 billion in 1978 but dropped to \$7.0 billion in 1981. With the advent of the 1981–83 recession, the deficit increased dramat-

**TABLE 2-1 Federal Government Fiscal Indicators**

	Expenditure (1)	Revenue (2)	NIA Deficit <sup>a</sup> (3)	Inflation Adjust- ment (4)	Inflation- adjusted NIA Deficit <sup>a</sup> (5)
	(\$ billion current)				
1970	14.8	15.3	-0.5	0.4	-0.9
1971	16.9	17.0	0.1	0.2	-0.3
1972	19.5	19.3	0.2	0.4	-0.2
1973	21.7	22.5	-0.8	0.7	-1.5
1974	28.0	29.6	-1.7	0.9	-2.6
1975	34.4	31.3	3.1	0.9	2.3
1976	37.6	34.8	2.7	0.9	1.8
1977	42.6	36.0	6.7	1.3	5.4
1978	47.8	37.7	10.1	2.0	8.1
1979	51.8	42.9	8.9	3.2	5.7
1980	60.0	50.4	9.7	4.5	5.1
1981	71.2	64.8	6.9	7.0	-0.1
1982	84.7	64.5	20.0	6.9	13.2
1983	92.9	69.1	23.9	5.1	18.8
1984 <sup>b</sup>	106.8	80.1	26.7	5.9	20.8
1985 <sup>b</sup>	113.1	90.1	23.0	7.4	15.6
1986 <sup>b</sup>	119.2	101.3	17.9	7.8	10.1
1987 <sup>b</sup>	126.6	108.5	18.1	8.2	9.9
1988 <sup>b</sup>	134.1	115.5	18.4	9.2	9.1

Source: Canada, Department of Finance, *The Deficit in Perspective* (Ottawa: The Department, April 1983).

a. A minus sign indicates a surplus.

b. Projected.

ically; the NIA federal deficit was over \$24 billion for calendar year 1983. Further, it is expected to remain in the \$20 billion range over the medium-term fiscal plan, i.e., through 1988.

A similar, though slightly less marked pattern emerges when the accounting distortions created by inflation are allowed for. In column 4 we show the inflation adjustment, equal to the stock of net fixed-value liabilities times the inflation rate. Column 5, equal to column 3 minus column 4, gives the inflation-adjusted NIA deficit; there is still a trend of increasing deficits throughout the period 1970-84, but it is less marked. Also, projected deficits actually fall by almost half on an inflation-adjusted basis through 1988.

Of course, one learns not to be shocked by nominal or dollar figures when nominal GNP has nearly quintupled in the past 15 years. In Figure 2-1 we show the deficit measures from columns 3 and 5 in Table 2-1 as a percentage of nominal GNP. As that figure shows, current deficits are high even in relation to nominal GNP. Further, projected actual federal deficits will not fall below 3 percent of GNP over the period 1984-88, and the inflation-adjusted federal deficit, while falling, remains historically high as well.

TABLE 2-2 Consolidated Governments Fiscal Indicators

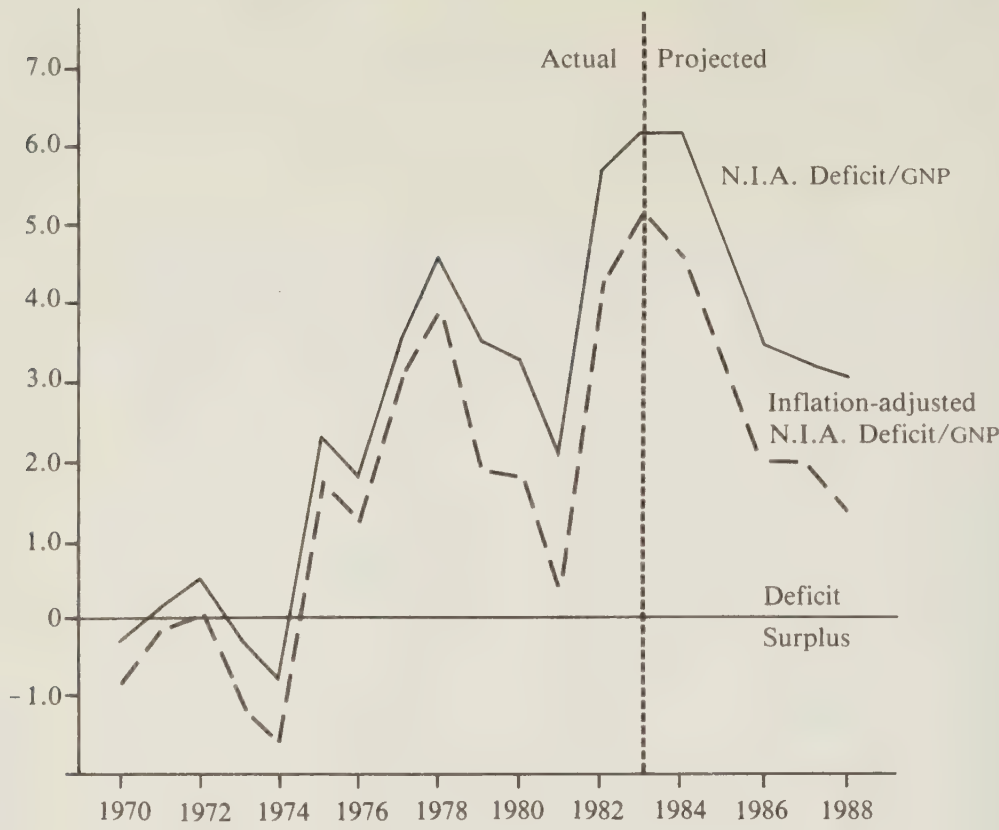
	Expenditure (1)	Revenue (2)	NIA Deficit <sup>a</sup> (3)	Inflation Adjust- ment (4)	Inflation- adjusted NIA Deficit <sup>a</sup> (5)
	(\$ billion current)				
1970	30.2	32.9	-2.7	0.8	-3.5
1971	33.4	35.9	-2.5	0.4	-2.9
1972	38.0	41.0	-2.6	0.7	-3.3
1973	43.8	47.6	-3.8	1.2	-5.1
1974	53.8	59.9	-6.1	1.6	-7.8
1975	66.5	66.3	0.2	1.5	-1.3
1976	75.4	75.1	-0.3	1.5	-1.8
1977	85.5	84.2	1.3	2.0	-0.7
1978	95.2	91.5	3.7	4.6	-0.9
1979	106.3	105.1	1.2	3.8	-2.6
1980	123.3	119.6	3.7	4.6	-0.9
1981	146.0	144.5	1.5	6.7	-5.2
1982	169.9	156.8	13.1	6.9	6.3
1983	186.8	166.7	20.1	5.2	14.9
1984 <sup>b</sup>	205.9	183.6	22.3	5.8	16.5
1985 <sup>b</sup>	222.1	202.6	19.5	7.1	12.4
1986 <sup>b</sup>	236.7	223.3	13.4	7.4	6.0
1987 <sup>b</sup>	253.1	240.5	12.6	7.5	5.1
1988 <sup>b</sup>	270.9	258.7	12.2	8.2	3.9

a. A minus sign indicates a surplus.  
b. Projected.

Table 2-3 presents some basic facts about the size of the federal debt. (Table 2-4 does the same for the consolidated governments sector.) Column 1 presents the current dollar value of net fixed-value liabilities — the figure used in calculating the inflation adjustment. The startling growth in this column reflects the persistent deficits over the period as indicated in Table 2-1. Column 2 measures the real value of NFVL using 1971 dollars; the less startling but still marked growth in this column shows the cumulative effect of the “real deficits” implicit in column 5 of Table 2-1. Column 3 shows the nominal debt-servicing requirement equal to interest payments on the national debt. Column 4 shows one measure of the government’s real debt-servicing requirement, equal to column 3 less the inflation adjustment calculated in the earlier tables.

As with flow measures in Tables 2-1 and 2-2, it is interesting to measure the debt in relation to nominal GNP. This is done in Figure 2-2. The solid line shows NFVL as a proportion in GNP; the decline in this ratio over the first part of the period reflects a downward trend that had prevailed since the end of World War II. The war was largely deficit financed, and the debt-to-GNP ratio exceeded 100 percent at the end of the war; for the next 30 years the ratio fell as the war debts were gradually

**FIGURE 2-1    The Federal Deficit as a Proportion of GNP**



*Note:* A negative number indicates a surplus.

*Source:* Canada, Department of Finance, *The Fiscal Plan* (Ottawa, 1984).

paid off in real terms. Since 1975 we have experienced an unprecedented peacetime run up in the debt-to-GNP ratio, reflecting the fact that deficits were large enough that the rate of growth in the nominal stock of debt exceeded growth of nominal GNP. The line of dashes shows the government's nominal interest payments as a proportion of GNP while the line of dots and dashes does the same for inflation-adjusted interest payments on the debt.

**The Deficit and the Economy**

In this section, we consider both the short-run and long-run roles that the government deficit plays in the economy. We take the level of government spending and concentrate on the question of how to finance that spending. From the fiscal authority's perspective, the choice is between current taxation and issuing debt.

***Why Do Deficits Matter?***

It is possible to imagine a world where the deficit, that is, the choice between current taxation and issuing government bonds, is irrelevant.

TABLE 2-3 Federal Government Debt Measures

	NFVL \$ Billion Current (1)	NFVL \$ 1971 Billion (2)	Interest Pay- ments on Debt \$ Billion Current (3)	Inflation-ad- justed Interest Payments on Debt \$ Billion Current (4)
1970	7.9	8.1	1.9	1.5
1971	8.1	8.1	2.0	1.8
1972	8.3	7.9	2.3	1.9
1973	8.8	7.8	2.5	1.8
1974	8.3	6.6	3.0	2.1
1975	7.9	5.7	3.7	2.8
1976	11.9	8.0	4.5	3.4
1977	16.0	9.9	5.1	3.8
1978	22.3	12.7	6.4	4.4
1979	34.9	18.4	8.1	4.9
1980	44.6	21.2	9.9	5.4
1981	55.8	23.5	13.7	6.7
1982	64.2	24.5	16.7	9.8
1983	87.9	31.6	17.7	12.6
1984 <sup>a</sup>	112.8	38.6	19.5	13.6
1985 <sup>a</sup>	140.1	45.5	21.6	14.2
1986 <sup>a</sup>	163.1	50.6	23.0	15.2
1987 <sup>a</sup>	181.8	53.9	24.1	15.9
1988 <sup>a</sup>	200.6	56.9	25.2	16.0

a. Projected.

That imaginary world, first considered by David Ricardo in 1817, would be populated by rational and far-sighted individuals who can borrow and lend in perfect capital markets. Spending decisions by such individuals would depend on their lifetime or “permanent” income only, and changes in the time-pattern of income receipts that leave the present value of those receipts unchanged would be irrelevant for private sector expenditure decisions. Current private expenditure would not be tied to current income in any simple, mechanical manner.

In this world, government bonds would not be net wealth because the financial value of a bond would be matched exactly by a corresponding liability for future tax payments. Specifically, households in the economy would be indifferent between paying a dollar of current taxes and paying a stream of future taxes which has a present value of one dollar when discounted at the market interest rate. In this case, the government deficit would not matter — bond rather than tax finance would merely represent a rearrangement in the timing of income receipts which the private sector could (and would) offset in capital markets. Issuing bonds now and raising taxes later would be viewed as equivalent to raising taxes now.

**TABLE 2-4 Consolidated Governments Debt Measures**

	NFVL \$ Billion Current (1)	NFVL \$ 1971 Billion (2)	Interest Pay- ments on Debt \$ Billion Current (3)	Inflation-ad- justed Interest Payments on Debt \$ Billion Current (4)
1970	15.0	15.4	3.2	2.4
1971	14.9	14.9	3.6	3.2
1972	15.1	14.4	4.1	3.4
1973	16.0	14.2	4.8	3.6
1974	15.1	12.0	5.4	3.8
1975	14.3	10.3	6.5	5.0
1976	20.2	13.5	8.1	6.6
1977	25.1	15.6	9.3	7.3
1978	31.1	17.8	11.3	6.9
1979	41.4	21.6	13.7	9.9
1980	45.2	21.5	16.6	12.0
1981	53.7	22.7	21.5	14.8
1982	63.7	24.3	25.7	18.8
1983	88.7	31.9	27.8	22.6
1984 <sup>a</sup>	110.6	37.8	n.a.	n.a.
1985 <sup>a</sup>	133.1	43.4	n.a.	n.a.
1986 <sup>a</sup>	153.2	47.5	n.a.	n.a.
1987 <sup>a</sup>	167.4	49.7	n.a.	n.a.
1988 <sup>a</sup>	180.9	51.3	n.a.	n.a.

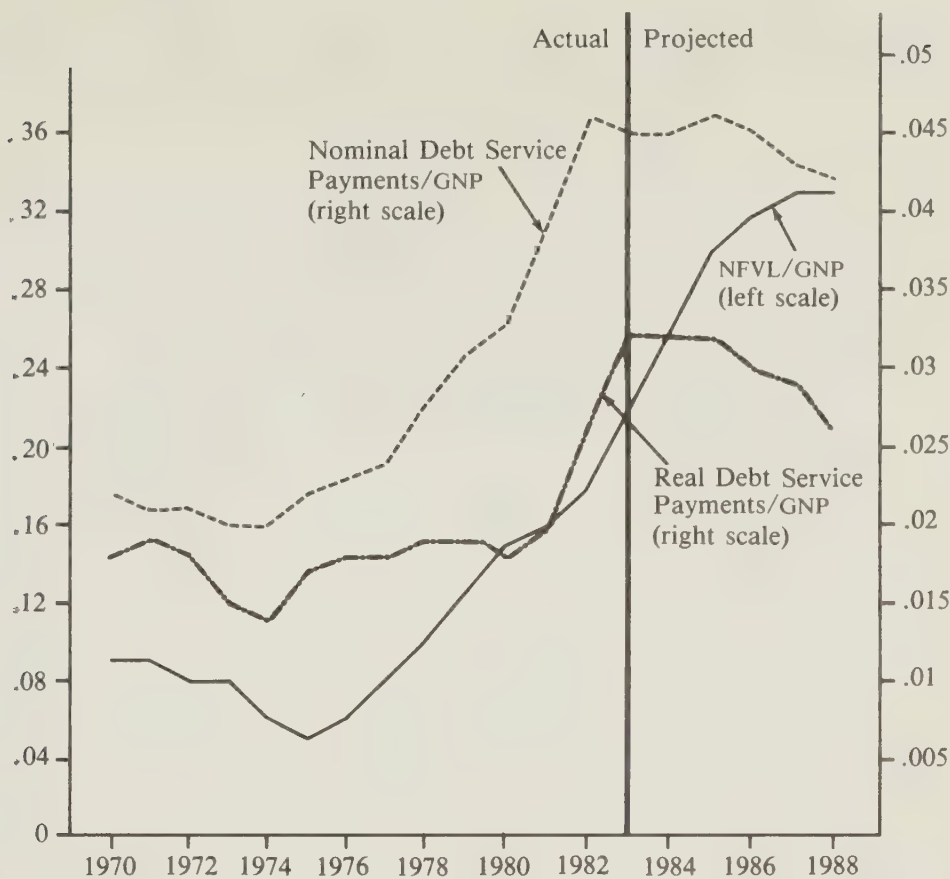
a. Projected.

There are good reasons to believe that this debt-neutral Ricardian model does not provide an accurate description of the working of a modern economy. (Ricardo himself rejected it.) For various reasons future taxes that have a present value of one dollar are not equivalent to present taxes of one dollar. We now discuss these reasons:

**1. The private sector borrows on different terms than the public sector.** This is perhaps the most important reason why the public debt is not neutral in practice. In many circumstances households, and to some extent firms, face borrowing constraints that prevent them from borrowing all that they would like to at the prevailing market interest rate. Alternatively, they may be able to borrow but at a much higher interest rate than that facing the government.

When agents are bound by such a constraint, their “internal interest rate” exceeds the market interest rate. When the government borrows to reduce the current taxes of the borrowing-constrained households in exchange for increased future taxes, the constrained households will discount those increased future taxes at their higher internal interest rate. Consequently the present discounted value of the taxes to the

**FIGURE 2-2    The Federal Debt as a Proportion of GNP**



Sources: Canada, Department of Finance, *Economic Review*, and *The Fiscal Plan* (Ottawa, 1984).

household will be smaller than the current taxes saved by the deficit finance. The households will not in this circumstance be indifferent to the public deficit; they will find in this case that their welfare has increased, and they will not therefore offset the government dis-saving with an equal increase in private saving.<sup>9</sup>

**2. The inability of private agents to insure against uncertainty in their future taxes.** Although the government budget constraint implies that deficits are matched by future taxes which are certain in the aggregate, the individual household is uncertain as to its share and to the timing of those future taxes. In contrast, its current tax liabilities are certain, or at least more certain. Because insurance markets are not complete, the individual household is not able to insure against this uncertainty in future taxes. Consequently it will discount future taxes at an interest rate lower than the market interest rate; specifically it will discount by the market interest rate less the risk premium that it attaches to the uncertainty of future tax liabilities. In this case the present value of the future taxes will be higher than the current taxes foregone, so an

incremental deficit will lower wealth. Further, the incremental deficit will be more than offset by incremental private savings.

**3. Labour market imperfections.** Labour market imperfections per se do not introduce an asymmetry between present and future taxes as perceived by the households. But in the presence of capital market imperfections such as those discussed above, labour market imperfections can multiply the impact of the deficit on aggregate spending. Some households in the economy may find themselves unable to work as much as they want to at the prevailing wage rate because of deficient demand for total output. Should the existence of a deficit cause total spending to change, this change will be multiplied as the labour market constrained households find themselves able to work longer hours and hence earn higher income. It is this interaction between the borrowing and employment constraints facing private households that is at the heart of Keynesian theories of the deficit.

**4. Finite lifetimes.** Another reason why households might view future taxes as not equivalent to current taxes is that future taxes may extend beyond the expected lifetime of the household. Thus the household may anticipate escaping taxes by dying! As R.J. Barro (1974) has pointed out, this would make no difference if households “care about their heirs”; in this case living households would simply alter their bequests by an amount equal to the expected increase in future taxes borne by their heirs. However, if they do not care or are unable to alter their bequests (perhaps because such bequests cannot be reduced below their current zero level), living households will in fact react to a change in the deficit in a manner that does not completely offset it.

**5. Distortionary taxes.** The Ricardian debt-neutral tax theorem assumes that all taxes are of a non-distortionary, or lump-sum nature. In fact, raising a given amount of tax revenues in any given year imposes an efficiency cost on the economy because of the disincentives that are posed for private decision makers by the prevailing marginal tax rates. (Incentives for working and for saving are probably the two most important that are adversely affected.) Under reasonable conditions, these efficiency costs will rise at an increasing rate with the level of tax revenues collected in any period. Consequently it is better to raise a given present value of taxes in an inter-temporally smooth pattern. This implies that if government expenditures vary over time, it will be socially desirable to deficit finance government expenditures that are higher than normal; such deficits do not directly affect aggregate spending in the economy, but they do minimize the social efficiency cost of collecting government revenue.<sup>10</sup>

**6. Myopic perception.** If some households imperfectly perceive the future tax liabilities implied by the government deficit, they will not offset government dis-saving with private saving. In this case, however, it is difficult to determine the welfare effects of the deficit because household preferences are, in some sense, irrational.

**Summary.** For our purposes, the basic feature of the economy that makes government deficits and the public debt matter is that, to a significant extent, current private sector expenditure is tied to current private sector income.<sup>11</sup> The government deficit influences the current income of the private sector, since for a given level of government expenditure a larger deficit means lower current taxes and hence larger current private disposable income. In the first instance, this debt finance simply causes an inter-temporal rearrangement of private sector income. But for all the reasons noted above, the private sector is not indifferent to this rearrangement of its income receipts. In particular, current private sector expenditure rises in response to the increase in current income.

This influence of government deficits on private spending not only creates the potential for a stabilization role for deficits over the business cycle, it also creates the mechanism by which persistent deficits become costly and undesirable in the longer run. This joint dependence of the long-term costs and the short-term benefits on the same characteristics of the economy is important, and often not recognized.

### ***The Deficit and Short-run Stabilization Policy***

The government has the potential to use its deficit constructively to smooth aggregate expenditure over the business cycle. Even with constant government spending, the financing of that spending can influence the economy. Issuing bonds rather than raising current taxes during a slump will raise current income and hence spending in the private sector. Such counter-cyclical budgetary policy can break the “chain” running from current income to current expenditure that lies at the heart of Keynesian multiplier theory, and thereby serve to dampen exogenously generated fluctuations.

By pursuing such a counter-cyclical budgetary policy the government essentially acts as a financial intermediary. During slumps it borrows on behalf of the liquidity-constrained private sector and passes the proceeds along in terms of a deficit. During booms it does the opposite, running a surplus. The government is in a position to do this because of its broad powers to tax and its related ready access to capital markets.<sup>12</sup>

For example, a laid-off employee may wish to borrow to maintain a consumption level and pay off the loan when reemployed. Private capital

markets provide only limited borrowing potential to such a person because of the inability of the creditor to secure a claim against future labour income. The government with its power to tax labour incomes can act as an intermediary by borrowing now (running a deficit) to finance unemployment benefits which will be recouped from future taxes. The laid-off employee need not reduce expenditure by as much and in this way the business cycle is mitigated. This is essentially how the stabilizing benefits are derived from deficits.

### *The Burden of the Public Debt*

Many people intuitively believe that a large and persistent government deficit is harmful. (Although the concern is often expressed in terms of deficits, the real concern is generally with the level of the national debt.) It is useful to separate the sound reasons for such concerns from the emotional views that frequently are expressed.

A major source of unwarranted alarm about the government deficit arises because of false analogies between government and private sector deficits. Households and firms that continually borrow to finance current (as opposed to capital) costs in excess of current receipts eventually go bankrupt; so it is often asserted that a similar fate awaits the government of an economy that tolerates large and persistent public deficits.<sup>13</sup>

Unlike households, the government does not have a finite lifetime over which its borrowing and lending must balance. Unlike private firms its ability to pay interest on its debt does not require that it hold income-generating capital assets. Rather, the government's ability to service its debt is based on its power to tax the private sector in various ways, including the power to tax through inflation by creating money. For this reason the criteria for establishing whether the government's deficit is "financially sound" are quite different from the criteria used in evaluating the deficit of a private household or firm. We argue that the essential criterion for evaluating the deficit from the perspective of concern about the long-term costs of the national debt must be determined from the time path of the debt-to-GNP ratio implied by the government's fiscal plan. We take this up below; in this section we introduce that analysis by considering the numerous costs associated with a high debt-to-GNP ratio.<sup>14</sup> The first two such costs listed below might be thought of as the primary burden of the debt, and are, to some extent, alternatives. The first cost would be most relevant for a closed economy, with the second being most relevant in an open economy such as Canada. The remaining costs might be thought of as the secondary burden.

**1. Reduced capital stock.** By creating bonds that are perceived as net wealth by individuals holding them, deficits can reduce the actual saving done by a society. Typically, savings and investment decisions are made

independently and are coordinated in capital markets which, in this sense, convert private savings into physical capital accumulation. Government deficits can be viewed as a leak in this process, a leak which converts savings back into consumption, and hence leads to less accumulation of physical capital than the same private saving would have supported in the absence of deficits. This creates a burden by reducing the capital stock inherited by the next generation.

**2. Foreign indebtedness.** Deficits raise domestic expenditure relative to domestic production, and thus cause a trade account deficit. The foreign borrowing that accompanies this deficit means that the capital stock, and hence output and employment, in the domestic economy is not reduced by the deficit. However, the burden of the debt arises because of increasing foreign indebtedness; the resulting interest and dividend payments to foreigners will lower domestic net income relative to output and employment.<sup>15</sup>

**3. Inflation.** Persistent deficits will drive up real interest rates and lead to increased pressure on the central bank to monetize some of the debt, thus leading to expansionary monetary policy and, eventually, increased inflation. In this regard, deficits are especially counter-productive to a monetary policy geared to lowering inflation.<sup>16</sup>

**4. Tax distortions.** The tax revenues needed to service the debt cannot be raised without cost. In addition to administrative costs, the tax system reduces economic efficiency by altering incentives. Non-market activities such as leisure are encouraged, saving and investment are reduced, and some sectors of the economy are discouraged relative to others. The larger the debt-to-GNP ratio, the larger are these costs relative to GNP.

**5. Interest commitments.** A large debt-servicing requirement has two major effects. First, it introduces uncertainty into the budget when interest rates are as variable as they have been over the period 1974–84. A sudden doubling of interest rates, for example, increases the government's interest bill and thus substantially enlarges the deficit. Second, interest payments are largely a non-discretionary claim on budget receipts. Thus a larger debt restricts the government's flexibility to alter its expenditures.

**6. Strait-jacket for stabilization policy.** There is a growing perception that a large stock of debt resulting from accumulated past deficits hinders stabilization policy by restricting the scope of actions available to the fiscal authorities. The debt service payments associated with a large debt constitute a large non-discretionary component in govern-

ment expenditure, reducing flexibility. Further, public concern about current and projected debt-servicing requirements leads to political resistance to increases in the deficit, even temporary counter-cyclical increases. For example, there is little doubt but that the large prevailing federal deficit and outstanding stock of debt severely reduced the politically acceptable scope for fiscal expansion in the April 1983 budget to combat the “great recession.”

It is for these reasons, rather than ungrounded fears of collective bankruptcy or the government’s inability to borrow, that the long-run costs of the current fiscal plan are important.

### *Relating the Two Roles of the Deficit*

The key behavioural argument made in the two preceding sections is that government deficits will influence private expenditure in the economy. Hence there are good reasons in particular circumstances for using debt rather than taxes to finance government expenditures; intelligent use of this option can serve to mitigate cyclical fluctuations in the economy. But it is important to realize that the decision to finance by debt rather than taxes defers but does not avoid the costs of government expenditure. It is fallacious to dismiss the national debt that accumulates from government deficits on the basis that “we owe it to ourselves.” As itemized above, there are real costs to be borne as a result of accumulating national debt. Further, since the short-run benefits and the long-run costs arise from the same behaviour, you cannot have it both ways as the “owe it to ourselves” view would have it.

This relationship between the short-run benefits and the long-run costs is a difficult one to understand and is, in our mind, the source of much confusion in the debate over government deficits. It is perhaps worth spelling out in some detail. In what follows we concentrate on the costs in terms of the reduced capital stock, although the argument holds equally for the other “burdens of the debt” itemized above. For simplicity, we consider a non-inflationary, zero-growth economy experiencing cyclical fluctuations around a given level of real national product.

Suppose this economy experiences a temporary recession, say generated by an exogenous fall in autonomous expenditure. As we have argued, a government deficit will provide some stimulus to the economy and hence help reduce the dead-weight costs of unemployment that would have occurred in the absence of the deficit. Further, the fact that the economy now operates at a higher level of capacity over this phase of the business cycle means that investment will be higher than it would otherwise have been; hence, at the end of that particular cyclical phase, the capital stock in the economy will be higher than it would have been without the government deficit. These are just the explicit manifestations of the short-term benefits that the stabilization role for deficits is capable of delivering.

Suppose now that, following this temporary recession, the economy proceeds along a steady full-employment path and that the government henceforth balances its budget. The deficit incurred during the recession will have caused an increase in the stock of government bonds held in individual portfolios; as a result of its increased holdings of these government assets, the private sector's desire to save and to accumulate other assets, including physical capital, will be diminished.<sup>17</sup> Over time this will mean that the privately held capital stock in the economy falls as a result of the deficit, even though the deficit was temporary and helped mitigate the initial recession.

It is obvious that this long-run reduction in the capital stock will be even larger should the government continue to run a deficit along the steady growth path. Should the government have incurred a small surplus along the full-employment path, the long-run costs could have been avoided altogether as the surplus would have reduced the stock of debt and hence eliminated the fall in private saving and real capital accumulation. The surplus would have had some deleterious effects on economic performance, however, which would have to be weighted against the elimination of the long-run costs.

Now suppose that following the initial recession the economy enters a boom phase and operates above capacity for a while; now the case for the government to incur a surplus is overwhelming. Not only will the surplus mitigate the boom and hence avoid the dead-weight costs that again arise because the economy is away from its long-run equilibrium, the surplus would also avoid the long-run costs that would arise should the stock of debt be allowed to increase permanently.

It is useful to compare this scenario with that which would arise in a Ricardian debt-neutral world. In that world an increased deficit would still mean, via the government's budget constraint, that future taxes would be higher. But the deferral of taxes would have no effects in a Ricardian economy; current and future taxes are equivalent in that world and the reduced current tax liabilities implicit in the deficit would merely be saved. In the more relevant model of the economy that incorporates imperfections in labour and capital markets, the deferral of taxes has real effects; in the example of this section it creates short-run benefits but also imposes long-run costs.<sup>18</sup>

If the economy actually did follow a smooth cyclical path fluctuating symmetrically around a steady long-run equilibrium level of output, then fiscal policy would be easy — the automatic stabilizers could be set so that the budget balances over the cycle and there would be no need for discretionary changes.<sup>19</sup> In such a happy circumstance there is no conflict or trade-off between the short-run and long-run effects of deficits; in principle the successful pursuit of short-run stabilization does not require any tendency for the stock of public debt to grow relative to GNP. It is the uncertainty and the unevenness of the cycle that makes budgetary policy, and in particular the balancing of its short and long-run

effects, interesting. We return to this issue of fiscal strategy in the face of uncertainty after a brief excursion into why there might be a need to constrain the government's ability to deficit finance.

### *The Political Economy of Deficit Finance*

As we have seen, the consequences of the government's ability to alter total saving in the economy can be negative as well as positive. There are two important elements that must be considered. First, the costs of programs that are financed by deficits are deferred in a real sense. To the extent that households in the economy imperfectly perceive the future costs of the programs while the current benefits are readily apparent, they will register political demands for programs that would not be wanted if the costs were known. Moreover, the short-term political horizon of elected policy makers will induce them to offer such programs even if the policy makers are fully aware of the deferred costs.<sup>20</sup>

Second, and perhaps more important, government debt provides a vehicle by which the present generation can transfer the burden of current government programs to future generations. The public debt is the only way existing generations can effectively consume the product of future generations.

Negative inheritances or bequests can be accomplished if the older generation sells its government bonds to the younger generations and thereby consumes some of their product. In this way the next generation purchases the government bonds (and the right to receive the interest on them) but inherits the tax liabilities that are required to pay that interest. In effect, the next generation has given up resources to purchase a collectively worthless asset. This is in contrast to what happens if the young generation purchases physical assets from the older generation; such physical assets are interest-earning assets that do not have a corresponding tax liability.

For the above reasons, constraints on the government's ability to issue debt may be justified. Constraints are needed to prevent the government, especially if it is responsive to the demands of living households, from being the instrument of inter-generational inequity. And to the extent that the deficit finance of government programs incorrectly conveys the costs of those programs to the electorate, leading the democratic political process to demand and supply too many programs, it may be necessary to limit the scope of deficit finance even in the absence of an inter-generational burden.

### *The Concept of Fiscal Prudence*

In the non-Ricardian world in which we live, the government deficit can be used to raise or lower the welfare of society, defined broadly to include

present and future generations. The improvement in welfare can be accomplished by short-run policies that use deficits to stabilize income and consumption in an economy with imperfect labour and capital markets (this does not require a change in the average debt-to-GNP ratio over the cycle) or through long-run policies that alter the average long-run debt-to-GNP ratio to achieve inter-temporal efficiency and inter-generational equity.

Unfortunately, economic science has not progressed to the state where a precise value for the optimum long-run average debt-to-GNP ratio is known. As a result it is difficult and controversial to attempt to put into operation the pursuit of the long-run efficiency and equity goals identified above.<sup>21</sup> This leads to the concept that elsewhere we have called “fiscal prudence.”

Fiscal prudence is not designed to achieve some perceived optimal long-run debt ratio. Rather, it is a requirement that permanent changes in the debt-to-GNP ratio not be used to achieve short-run objectives such as stabilization. Permanent changes should be justified only in terms of long-run considerations. In the absence of such a justification, changes in the debt ratio (such as may occur during a recession) must be offset in the long run. Even once this argument is accepted, the difficulty lies in designing a rule that insures fiscal prudence but does not unduly restrict the government’s ability to pursue stabilization policy.

In the absence of an optimal long-run debt policy, rules that ensure fiscal prudence appear arbitrary. Many economists, who focus only on stabilization issues, have tended as a result to ridicule and dismiss such rules. This attitude is exemplified by Abba Lerner’s notion of “functional finance.” It is therefore important to realize that a rule, while arbitrary, may still be desirable.<sup>22</sup> Imperfect knowledge about the optimal debt ratio does not justify disregarding rules of fiscal prudence just because they are arbitrary.

## **A Framework for Evaluating Deficit Policies**

We have argued that there are two overriding policy issues concerning the deficit. The first concerns its use as a stabilization tool over the course of the business cycle. The second concerns the inter-temporal allocation of the fiscal burden and the need for the political process to restrain government from undertaking programs which offer current benefits at the expense of higher taxes and/or lower government services in the future when there are no economic arguments for deferring the costs in this way. We have referred to the second issue as the problem of enforcing fiscal prudence.

It is necessary to evaluate how any given fiscal plan (a statement of projected revenues and expenditures presented with each federal budget) meets the two objectives of stabilization and prudence. In this

evaluation it is important to keep the distinction between the two issues clearly in mind. Indeed many of the conflicting opinions about the deficit result from concentrating on one or the other objective, and often the failure to resolve differences about deficit policies stems from a confusion of the two issues. In this section we consider the problem of evaluating deficits, first from the perspective of stabilization, and then from the more difficult perspective of fiscal prudence.

### *Deficits and Stabilization Policy*

As discussed above in the subsection on the burden of the debt, the deficit contributes to aggregate demand in an economy where private agents are unable or unwilling, through their own saving decisions, to offset the dis-saving undertaken by the government. In this way, deficits that vary counter-cyclically can smooth aggregate demand and hence income.

The deficit is, as we have tried to emphasize, just a summary statistic, and even after it has been inflation adjusted it is still a crude measure with which to evaluate fiscal policy. In this section we consider two further refinements or adjustments that conventionally are used in assessing fiscal stabilization. The first is to take account of the different effects that individual components of the deficit may have on aggregate demand; the second is to make it possible to distinguish discretionary fiscal policy by eliminating the automatic fluctuations in the deficit that occur over the cycle due to the dependency of taxes and transfers on the level of economic activity.

### THE WEIGHTED DEFICIT

The actual effect of a given deficit on aggregate demand depends on the multiplier effect which in turn depends on how the deficit is created. For example, the multiplier for deficits created by tax reductions or increased transfers to persons is less than the multiplier for deficits created by increased government expenditure on domestic goods and services. In fact, the multiplier may differ according to which tax or transfer program is altered or which goods and services are purchased by the government.<sup>23</sup> For this reason, using the deficit (even properly adjusted for inflation) as an indicator of the effect of the government on aggregate demand may be quite inadequate. Some attempts at resolving this problem have utilized the concept of the weighted deficit where the weights on different components contributing to the deficit depend on estimated multipliers. The U.K. government publishes such a weighted deficit series. Alternatively, if one has access to an econometric model of the economy, one can forego the use of the deficit as a summary statistic altogether and evaluate the implications of tax and expenditure policies themselves.

An important problem with the weighted deficit is that the value of the component multipliers are uncertain. Moreover, such multipliers may change over time. If the relative sizes of the expenditure and revenue components do not change as the deficit changes, the unweighted NIA deficit (properly adjusted for inflation) does provide an adequate measure of the net contribution to aggregate demand by government tax and expenditure policies.

## CYCLICAL ADJUSTMENTS

Another issue of importance in evaluating the stabilization role of the deficit is the separation of automatic and discretionary deficit policies. As discussed earlier, the deficit automatically varies counter-cyclically over the business cycle because net tax/transfers vary positively with income. It is useful to separate this automatic component from any autonomous (or exogenous) changes in deficits. In particular, autonomous changes in the deficit (which may reflect discretionary policies) can offset or reinforce the automatic stabilization provided by the tax and transfer system. Separating the automatic or cyclical component of the deficit from the autonomous component is necessary to assess the discretionary “fiscal stance” of the government. That is, has the government carried out discretionary policies (or allowed non-policy autonomous changes to occur) which have aggravated or mitigated the cycle relative to the automatic stabilization provided by the tax and transfer system?

The cyclically adjusted deficit is calculated by standardizing government expenditures and revenues for income fluctuations over the business cycle. The standard practice, as followed by the Department of Finance, is to calculate a cyclically adjusted measure of GNP based on average labour utilization rates and trend growth rates for labour productivity. There is some degree of latitude in making these adjustments; for example, the Department of Finance reports two cyclically adjusted deficit series based on high and low trend growth rates for labour productivity, respectively. The calculation of average labour utilization rates involves arbitrary assumptions as well. Once a cyclically adjusted GNP measure is obtained, the cyclically adjusted values for revenues and some transfers are calculated using the historic elasticities between the various revenue and expenditure components and GNP. Subtracting the cyclically adjusted deficit from the actual deficit gives the cyclical component.

It should be stressed that, unlike the inflation adjustment, the cyclical component of the deficit is, in every sense, a real deficit that adds to the real indebtedness of the government. That is, the cyclically adjusted deficit is only a hypothetical deficit which is calculated on the counterfactual assumption that output is at the cyclically adjusted level. Even so, it is not the hypothetical deficit that would occur if the GNP is and

always was at its cyclically adjusted level. The cyclically adjusted deficit, although based on a hypothetical output level, is based on the *actual* stocks of government debt and associated interest payments in the year rather than the hypothetical stocks that would have occurred had GNP always been equal to its cyclically adjusted level.

## THE STRUCTURAL DEFICIT

When the cyclical component of the deficit is subtracted from the inflation-adjusted deficit we obtain the so-called structural deficit.<sup>24</sup> Several caveats are important when discussing the structural deficit as calculated in this way. First, the level of the structural deficit depends on rather arbitrary assumptions in defining the business cycle. For this reason it is often more informative to look at changes in the structural deficit rather than its level. Second, changes in the structural deficit can come about from autonomous changes other than discretionary policy changes. For example, changes in the interest rate or the world price of oil would affect the structural deficit in Canada without any government policy changes. Nevertheless, changes in the structural deficit are a useful indicator of the discretionary fiscal stance. (Even if the structural deficit changes for reasons other than a change in policy, the government might have been able to offset such a change through policy actions.)

### *Deficit Policies and Fiscal Prudence*

As we have stressed, deficits incurred for stabilization purposes are, by their nature, temporary and can be offset by surpluses during boom phases of the cycle. There is no need on stabilization grounds for a permanent rise in the government debt. Stabilization policies per se reduce involuntary layoffs and thereby raise the expected employment income of households. Existing households would not gain in their lifetime ability to consume as a result of persistent deficits which lead to accumulation of public debt, and future generations would lose. Accordingly, fiscal plans leading to persistent deficits and debt accumulation are labelled “imprudent.”

A prudent fiscal plan means that the government “balances” its budget over the business cycle where “balance” is subject to the qualification, noted in Bruce and Purvis (1983a), that there be an average deficit sufficient to allow for some desired growth in nominal liabilities. Long-run theories of the government debt usually prescribe a constant long-run debt-to-GNP ratio. The reason is that, in an economy where nominal GNP grows at a trend rate (say, 8 percent including real growth and steady-state inflation), government revenues grow at the same rate. This permits the debt service expenditures to grow at this rate without raising taxes or lowering other government expenditures relative to GNP. Consequently, the government budget does not literally have to be balanced,

even over the long run. A deficit equal to the trend nominal growth rate times the desired stock of government debt is consistent with fiscal prudence. In this section we shall, therefore, use the term balance in this sense.

As we have noted above, however, conflicts often do arise between the short- and long-run objectives of fiscal policy. As a result a number of different prescriptive rules in the literature address themselves to the need for short-term stabilization policy within the context of a credible medium-term fiscal plan which somehow constrains the government's propensity to resort to deficit finance. We now consider some of these policy proposals.

## A ZERO STRUCTURAL DEFICIT

A zero structural deficit is usually interpreted as neutral from the perspective of stabilization policy. Many commentators have also wanted to use it as a criterion for whether the government's fiscal plan is prudent in the sense we have defined here. Unfortunately this use of the structural deficit is inappropriate in a number of ways.

First, since it is the change in the structural deficit that is usually taken as an indicator of the change in the fiscal stance, it matters little what base income level is used in calculating the cyclical adjustment. For fiscal prudence, this issue is critical — a zero average cyclically adjusted deficit may still contribute continuously to the debt-to-GNP ratio if the income base on which the cyclical adjustment is made is persistently above the cyclical average level.

Another shortcoming of using the structural deficit in this way lies in the inflation adjustment. As discussed in the section on adjusting for measurement errors, the structural deficit is calculated using the actual inflation rate and the actual stock of net fixed-value liabilities. We argue that this is correct if one is assessing the impact of the deficit on national income. This procedure may be misleading if one is evaluating fiscal prudence because, through the inflation adjustment, the structural deficit will be reduced (other things being equal) by either a higher inflation rate or a larger stock of debt. Since both of these things represent the negative effects of large deficits that fiscal prudence strives to avoid, this adjustment is undesirable from the viewpoint of assessing prudence.<sup>25</sup> A zero structural deficit is consistent with any pattern of growth of the debt-to-GNP ratio, and hence the structural deficit is of little use in evaluating fiscal prudence.<sup>26</sup>

## AN ANNUALLY BALANCED BUDGET

Perhaps the simplest and best-known rule for maintaining fiscal prudence is the requirement that the government balance its revenues and expenditures on an annual basis. This requirement has been attacked and ridiculed as arbitrary. ("What is sacred about a year?") We have

argued that this criticism is inappropriate because all rules that enforce fiscal prudence appear arbitrary. However, there remains a fundamental problem with the annually balanced budget. A year is shorter than the average business cycle so the requirement to balance the budget over the year forces the government to make pro-cyclical expenditure and revenue changes. But there is no justification for sacrificing short-term stabilization in this manner to ensure fiscal prudence, and hence there is no justification for this extreme neo-conservative position.

## A CYCLICALLY BALANCED BUDGET

More sophisticated is the notion of balancing the budget over the cycle. In this case, deficits incurred during recessions are offset by surpluses in expansions. Although this rule allows the government to follow counter-cyclical policy, it also has shortcomings. The major difficulty is ensuring that deficits generated during a recession are in fact offset by surpluses during expansions, i.e., in ensuring that the government does not renege on its commitment to fiscal prudence and accept, *ex post*, the increase in the debt-to-GNP ratio that occurred over the recession.<sup>27</sup> This shortcoming raises a problem that is encountered whenever an attempt is made to reconcile fiscal prudence with stabilization. The primary difficulty in this regard for the cyclically balanced budget proposal is that the business cycle is not well defined in the sense of being either symmetrical or regular. Before the fact, it is difficult to know whether the economy is in a prolonged recession or whether it has entered a period in which the long-term trend growth rate is lower. The government may be unrealistic as to what constitutes a sufficiently robust expansion for it to generate the surpluses needed to balance the budget. As a result, the debt ratio creeps upward from cycle to cycle.<sup>28</sup>

The cyclically balanced budget also ignores the dynamic elements of the problem arising from changes in the stock of debt over the business cycle. This stock of government debt varies in a way that is not in phase with the cycle of GNP. Thus, at given interest rates, the debt service expenditures of the government will not be in phase with the business cycle. As a result, the appropriate deficit policy for both stabilization and fiscal prudence purposes is difficult to design and enforce.

Nevertheless, the cyclically balanced budget concept, modified to allow the cycle-average deficit to meet the requirements for additional government debt arising from real growth and target inflation, provides in principle a useful framework in which the government can pursue our twin goals of fiscal policy. Unfortunately, it appears not to be operational (see also Bruce and Purvis, 1983b).

## STABILIZING THE DEBT-TO-GNP RATIO

Because of the difficulties with using the deficit for the purposes of fiscal prudence, some analysts take the debt-to-GNP ratio. The use of this ratio

has two immediate advantages. First, it automatically avoids the problem of adjusting the deficit for inflation because both the numerator and the denominator of this ratio are measured in nominal terms. Second, it automatically allows for trend growth in the public debt to match the trend growth in nominal GNP. The problem of reconciling fiscal prudence and stabilization policy is not resolved however.

Analogous to the annually balanced budget is the requirement that the debt-to-GNP ratio remain constant from year to year. Although this would permit deficits that are consistent with trend growth in the government debt, it would still force the government to pursue pro-cyclical policies over the business cycle. Indeed, the strict requirement that the debt ratio be constant would result in policies even more destabilizing than those required by the annually balanced budget. This is because, over the cycle, the numerator and denominator of the debt-to-GNP ratio would move in opposite directions.

## PRUDENT AND IMPRUDENT DEFICITS

Stabilization and fiscal prudence could be attained with a policy that allows the debt-to-GNP ratio to vary over the cycle as needed for stabilization policy but which imparts no trend to the debt ratio. Such a policy allows for trend and cyclical components of the deficit but avoids incurring permanent changes in the debt burden for short-run objectives. The difficulty lies in designing a fiscal framework that would enforce the requirement that the debt ratio remain constant on average over time.

As in the case of the cyclically balanced budget, the government would have to be prevented from reneging on the commitment to reduce the debt ratio following a recession or from requiring unrealistic or undesirable economic conditions to prevail before it will carry out such a commitment. Such an objective can only be achieved through the political process by an informed electorate. We view the issue of implementing such policies as beyond the scope of this paper. Our objective in the remainder of this section is to suggest a means of monitoring and planning deficit policies in a way that directs attention to the long-run issues of fiscal prudence but allows the government flexibility to pursue stabilization policy or, at least, does not require it to undo the automatic stabilization provided by the tax and transfer system.

Our approach is to provide a measure of that component of the deficit which is consistent with long-run fiscal prudence in being, cyclical factors aside, consistent with convergence to some desired or target debt-to-GNP ratio at some desired speed.<sup>29</sup> Any remaining deficit is then identified as imprudent. This approach has the distinct advantage of providing a deficit measure directed at the long-run issue of concern — the debt-to-GNP ratio. Accordingly it provides some measure of the “order of magnitude” involved when concern is expressed about current

and projected deficits. Finally, the approach makes it necessary to be explicit about the desired or target stock of debt and about the speed with which the actual stock should be approached. These features are a mixed blessing; although such desired values are implicitly at the heart of much disagreement, making them explicit is no guarantee that agreement will be easier to obtain.

The imprudent deficit, so calculated, can then provide additional information — along with the structural deficit — which the fiscal authorities can use in designing policy, and which critics can use to assess a given fiscal plan. An imprudent deficit in any given year may serve the purposes of stabilization policy. However, to avoid permanent changes in the debt-to-GNP ratio, this imprudent component should be eliminated when the economy returns to its trend growth path.

Should the concept, if not a particular implementation of it, come to be accepted as part of the conventional wisdom, it could help provide the incentives for governments to behave prudently.

## **Evaluating the Canadian Deficit**

Our main concern in what follows is with the federal deficit. The federal government is the key to both active stabilization policy and the persistent deficits which are the source of concern. Although our discussion focusses on the federal deficit, we do present the various calculations on a consolidated governments basis for comparison purposes. It is worth noting, however, that, owing to differences in taxing power and access to capital markets, the application of the concept of prudence may differ for provincial or municipal governments.<sup>30</sup>

### ***Stabilization Policy***

In column 3 of Table 2-5 we show the structural deficit of the federal government as calculated by the Department of Finance (equal to the inflation-adjusted NIA deficit less the cyclical adjustment for the low trend productivity growth assumption).<sup>31</sup> (Table 2-6 shows the same calculations on a consolidated governments basis.) Table 2-5 indicates a relatively small and stable structural surplus in the first half of the seventies followed by a growing structural deficit until the last year of the decade. In 1979 the structural deficit drops sharply and almost vanishes by 1981. After 1981 the structural deficit again rises, reaching a peak in 1984 (figures for 1984 and after are projections made by the Department of Finance in 1983; the 1984 figure is expected to underestimate the actual deficit.) Under the 1983 Fiscal Plan, the structural deficit will then remain relatively constant in dollar terms but decline slowly as a percentage of GNP.

This pattern indicates that the discretionary policies of the federal

TABLE 2-5 Federal Government Structural Deficits<sup>a</sup>

	Inflation- adjusted NIA Deficit (1)	Cyclical Adjustment (CA) (2)	Structural Deficit (SD) (3)	SD as % of CA GNP (4)
	(\$ billion current)			
1970	-0.9	-0.3	-1.2	-1.4
1971	-0.3	-0.1	-0.4	-0.4
1972	-0.2	0.1	-0.1	-0.1
1973	-1.5	1.0	-0.5	-0.4
1974	-2.6	1.6	-1.0	-0.7
1975	2.3	0.0	2.3	1.4
1976	1.8	0.7	2.5	1.3
1977	5.4	-0.5	4.9	2.3
1978	8.1	-0.8	7.3	3.1
1979	5.7	-0.4	5.3	2.0
1980	5.1	-2.0	3.1	1.0
1981	-0.1	-1.8	-1.9	-0.6
1982	13.2	-9.4	3.7	2.0
1983	18.8	-10.6	8.2	2.0
1984 <sup>b</sup>	20.8	-8.5	12.3	2.7
1985 <sup>b</sup>	15.6	-7.4	8.2	1.7
1986 <sup>b</sup>	10.1	-5.7	4.4	0.8
1987 <sup>b</sup>	9.9	-3.5	6.4	1.1
1988 <sup>b</sup>	9.1	-0.9	8.2	1.4

a. A minus sign indicates a surplus.

b. Projected (using Department of Finance low-trend productivity).

government coupled with other autonomous (that is, not income dependent) changes in expenditures and revenues made a relatively stable contribution to demand in the seventies except in the years 1977–79 when there was an increase in fiscal stimulus followed by a contraction. The federal government responded to the 1982–83 recession with a sizable increase in discretionary (or at least, autonomous) stimulus (recall that this is over and above the automatic fiscal stimulus provided by the tax and transfer system). The 1984 Fiscal Plan called for a partial removal of this discretionary stimulus by 1985 followed by stable discretionary stimulus thereafter.

Similar changes are indicated by the high-trend productivity growth structural deficit and by the structural deficit for the consolidated government sector, although the level of the structural deficit is made much lower (indeed there is a structural surplus in many years) by these assumptions. Under the high-trend assumptions the structural deficit for the federal government almost vanishes by 1988 while structural surpluses are projected for 1986 and after for the consolidated government sector.

A different methodology for calculating the structural deficit is used

**TABLE 2-6 Consolidated Governments Structural Deficits<sup>a</sup>**

	<b>Inflation- adjusted NIA Deficit (1)</b>	<b>Cyclical Adjustment (CA) (2)</b>	<b>Structural Deficit (SD) (3)</b>	<b>SD as % of CA GNP (4)</b>
	(\$ billion current)			
1970	-3.5	-0.4	-3.9	-4.5
1971	-2.9	-0.2	-3.1	-3.3
1972	-3.3	0.2	-3.1	-3.0
1973	-5.1	1.3	-3.8	-3.2
1974	-7.8	2.0	-5.8	-4.0
1975	-1.3	0.0	-1.3	-0.08
1976	-1.8	0.9	-0.9	-0.04
1977	-0.7	-0.6	-1.3	-0.06
1978	-0.9	-1.0	-1.9	-0.08
1979	-2.6	-0.2	-2.8	-1.1
1980	-0.9	-2.2	-3.1	-1.0
1981	-5.2	-1.4	-6.6	-1.9
1982	6.3	-11.6	-5.3	-1.4
1983	14.9	-14.6	0.3	0.1
1984 <sup>b</sup>	16.5	-11.3	5.2	1.1
1985 <sup>b</sup>	12.4	-9.8	2.6	0.5
1986 <sup>b</sup>	6.0	-7.5	-1.5	-0.3
1987 <sup>b</sup>	5.1	-4.3	0.8	0.1
1988 <sup>b</sup>	3.9	-0.8	3.1	0.5

a. A minus sign indicates a surplus.

b. Projected (using Department of Finance low-trend productivity).

by Bossons and Dungan (1983). They simulate a no-recession scenario using the FOCUS econometric model and estimate the inflation-adjusted deficit in this scenario. On the basis of their measure of the structural deficit, Bossons and Dungan conclude that there is no “chronic deficit” and that at the time they wrote in 1982 “the current fiscal stance would have to be classified as actively deflationary” (p. 26).

The study by Bossons and Dungan is significant in that it reveals the conflicting elements that arise with regards to the deficit when the issues of fiscal prudence and measuring the fiscal stance are not separated. For example, Bossons and Dungan exclude certain transactions such as pensions and superannuation from their measured deficit because they are not permanent. However, other elements that influence the deficit and are likely to be transitory, e.g., current inflation and real interest rates, are used in calculating their adjusted deficit. Then on the basis of their adjusted deficit they draw conclusions about the fiscal stance on which the excluded transactions certainly bear. Also, in estimating the structural deficit they calculate revenues and expenditures using hypothetical, no-recession scenario inflation rates which are significantly higher than actual inflation rates. On the other hand, they adjust their

hypothetical deficit for inflation using these actual, lower inflation rates. This confusion of actual and hypothetical inflation rates, as well as their inconsistent application of the distinction between transitory and permanent factors, makes it difficult to interpret Bossons and Dungan's structural deficit from either the stabilization or the prudence point of view.

### *Is Canada's 1984 Fiscal Plan Prudent?*

Loosely speaking, we argue in the previous section that a fiscal plan is prudent if, given some realistic estimates of economic performance and inflation targets over the medium term, the ratio of the stock of interest-bearing government debt to nominal GNP will not remain permanently above some target value. To assess fiscal prudence more accurately, we present in Table 2-7 our measure of the projected imprudent deficit over the period 1984–88 for the federal government. (Table 2-8 presents analogous calculations on a consolidated governments basis.) For comparison purposes, we also present the high and low productivity assumption structural deficits in columns 1 and 2. In column 3 we give our preferred measure of the imprudent deficit.

As argued above, this measure involves adjusting the deficit for cyclical factors and for growth in the debt consistent with convergence of the debt ratio at the desired speed. Our calculations are based on a speed of adjustment equal to the nominal growth rate of the economy. This is a fairly undemanding interpretation of prudence, requiring only that about one-half the gap between the actual and target ratio be made up within a decade. Further, this choice makes the imprudent deficit rather directly comparable to the structural deficit.

The imprudent deficit is equal to the NIA deficit less a cyclical and inflation adjustment (analogous to but not identical to those used in calculating the structural deficit) and less a term to allow for real growth in the economy. More precisely, the imprudent deficit differs from the more common structural deficit in the following four ways. First, the cyclical adjustment made in calculating the structural deficit is often based on unrealistic assumptions about "normal" or potential output. Accordingly, these adjustments are typically negative or projected to be negative throughout the period. In terms of prudence, a more realistic view of potential output seems to be in order; for example, a cycle-average of output, adjusted for trend growth, would clearly be preferable. However we do not have the resources to calculate an appropriate cycle-average series of potential output; in our calculations we use the Department of Finance's low productivity series which assumes that the economy was on its trend growth path in 1979 and returns to it by 1988.

Second, the inflation adjustment made in calculating the structural deficit is typically calculated using actual or forecast rather than target inflation

**TABLE 2-7 Alternative Measures of Projected Federal Government Deficits**

	Structural Deficit		Imprudent Deficit	
	Assuming Low-trend Productivity Growth (1)	Assuming High-trend Productivity Growth (2)	Using 1979 Debt-to-GNP Ratio as Target (3)	Using 1983 Debt-to-GNP Ratio as Target (4)
	(\$ billion current)			
1984	10.5	7.5	12.5	11.2
1985	7.1	3.3	8.7	8.0
1986	3.9	0.3	5.8	4.0
1987	7.2	3.3	9.0	5.9
1988	7.1	2.9	11.0	8.2

**TABLE 2-8 Alternative Measures of Projected Consolidated Government Deficits**

	Structural Deficit		Imprudent Deficit	
	Assuming Low-trend Productivity Growth (1)	Assuming High-trend Productivity Growth (2)	Using 1979 Debt-to-GNP Ratio as Target (3)	Using 1983 Debt-to-GNP Ratio as Target (4)
	(\$ billion current)			
1984	3.6	0.7	4.5	3.8
1985	1.3	3.4	2.0	1.1
1986	1.8	-6.9	-1.8	-2.3
1987	1.6	-4.0	2.0	-0.5
1988	2.0	-3.4	3.6	2.1

rates. As argued above, actual inflation rates do measure the amortization of real public debt but one would not want a fiscal plan which is prudent only if an undesirably high inflation is in progress. In columns 1 and 2 of Table 2-7, the Department of Finance projections for inflation (as measured using the gross national expenditure deflator) average around five percent. We take this as a reasonable target and so use it in our calculations of the imprudent deficit, with the caveat that a goal of lower inflation would mean that a smaller inflation rate should be used.

Third, the most serious problem with the conventional inflation adjustment may be that it rises rapidly because the outstanding stock of net fixed-value public liabilities has risen rapidly. We argue that the fiscal plan should be judged prudent in terms of whether a target ratio of outstanding interest-bearing debt to GNP is maintained. (Recall the earlier discussion about the inappropriateness of the structural deficit

for assessing fiscal prudence.) Ideally, one would want some theoretically determined optimal debt-to-GNP ratio on which to base this adjustment; however, as we observed above, economic science does not yet permit the easy calculation, or acceptance, of such an optimal figure. For a number of reasons — including perhaps the need to maintain a market for government debt in order to pursue stabilization policy and, more importantly, the concern for inter-temporal efficiency — the optimal stock of debt will be positive.

For our calculations we have chosen the debt-to-GNP ratio in 1979 as the target since it approximately equals the average of the preceding 15 years. Assuming the ratio of net fixed-value liabilities to interest-bearing debt remains constant and given that actual and potential GNP were roughly equal in 1979 according to the low-trend assumption, we set the target ratio of net fixed-value liabilities to potential GNP at 13.1 percent for the federal government and at 15.7 percent for consolidated governments. We have multiplied these ratios by the low-trend potential GNP estimates to obtain the target net liabilities ( $NL^*$ ) for 1979 through 1988. The inflation adjustment is calculated by applying the target or projected inflation rates to  $NL^*$  for the respective years.

Fourth, we argued above that a component of the deficit attributable to trend output growth is consistent with a prudent fiscal plan.<sup>32</sup> To allow for the prudent growth in the government's stock of debt that is permitted by the trend growth of GNP, we have adjusted the projected deficits by a term equal to  $NL^*$  times the Department of Finance's low-trend growth rate.

These calculations suggest that the federal fiscal plan is imprudent in that there is an imprudent deficit of over \$11 billion by 1988. Only by reducing the deficit by that amount by 1988 would we ensure that if the economy operates "normally" on average after that year the target inflation rates and debt ratios will be reached. We stress that the target debt ratio will only be reached in the long run. That is, we have allowed for the maximum time possible in which the economy returns to the target debt-to-GNP ratio and, correspondingly, the minimum deficit reduction consistent with our criterion of fiscal prudence.<sup>33</sup> There is, of course, an unavoidable sense of arbitrariness to these calculations, based as they are on our chosen values for several key parameters. It is worthwhile examining the importance of these chosen values. First, consider our target inflation and cyclical adjustment assumptions. As we argued above, we think that, if anything, we have been too generous here. Only by projecting (and accepting) higher inflation and/or unrealistic estimates of normal economic performance could the prudence of the current fiscal plan be defended. We believe it would be imprudent to base fiscal plans on such a scenario. Second, our speed of adjustment was chosen to ensure that our application of the concept of prudence was not overly restrictive.

The other key assumption on which our conclusion of fiscal imprudence is based is our choice of the pre-recession 1979 debt-to-GNP ratio as the target. We believe that the authorities should not be indifferent to the debt-to-GNP ratio. Fiscal prudence requires more than just stabilizing the debt-to-GNP ratio, it requires stabilizing it at a reasonable level.

We chose the 1979 level as reasonable for several reasons. It preceded the 1980 and 1982 recessions, and it included the gradual growth in the ratio that occurred during the last half of the 1970s after a quarter-century of decline. Hence it represents a sort of moving-average level. Others may question this and wish to take a different value. For comparison purposes, in column 4 of Table 2-7 we calculate the imprudent deficit on the much less stringent assumption the entire 1979–83 run-up in the debt be accepted as permanent, and hence that the post-recession, 1983 debt-to-GNP ratio be adopted as a target. As can be seen in the table, on even this “generous” calculation, the imprudent deficit is \$8.3 billion by 1988.

Reasonable people may disagree about what the correct debt-to-GNP ratio is, and hence may wish to adjust our calculations. But we reject the possibility that the target debt-to-GNP ratio should be tripled, as would be required for the current fiscal plan to be judged prudent by 1988. (This requires the target debt-to-GNP ratio to be 0.383, nearly three times the 1979 ratio.) This, to us, renders the notion of fiscal prudence totally empty; virtually any fiscal plan could be interpreted as prudent if we were willing to accept a high enough debt-to-GNP ratio.

Finally, we stress that the acceptance of a target debt ratio clearly shows that the current fiscal plan indicates a rising imprudent deficit over the medium term, independent of the “level” of the target chosen for the debt-to-GNP ratio or the speed of adjustment, and hence of the level of the calculated imprudent deficit. This is one undeniable basis for concern — not alarm, but concern — over the medium-term fiscal plan. It also stands in sharp contrast to those who argue on the basis of a disappearing structural deficit that concern over the debt implications of the fiscal plan are misplaced. That sanguine view draws false support from an inappropriate measure.

## **Designing a Fiscal Strategy**

The calculations presented above do not provide any basis for a “catastrophic” view of the deficit problem. Nor do they suggest a need for a drastic fiscal cutback; rather the action called for is systematic and concerted, but gradual. The key proposition is that, just as the costs of deficit finance are only deferred and not avoided, so is the required adjustment. Starting the adjustment now will allow for a smoother, more gradual policy response than further deferral.

One conclusion that we wish to draw concerns the choice between

automatic and discretionary stabilization. Elsewhere (Bruce and Purvis, 1983a), based on the need to combine the stabilization role of deficits with fiscal prudence, we argued for greater reliance on automatic fiscal stabilizers. Not only do discretionary changes run the risk of being perverse because of administrative lags and misreadings of economic signals, they are also difficult, if not impossible, to combine with fiscal prudence. In contrast, automatic stabilizers (or, more generally, fiscal rules) can exploit the potential for stabilization while maintaining credibility that any deficits created are consistent with fiscal prudence. Fiscal prudence relies on an essential symmetry between expansionary and contractive fiscal actions; automatic stabilizers are by their very nature symmetrical while the political process imparts a distinct asymmetry (and imprudence) to discretionary fiscal policies.<sup>34</sup>

A second conclusion is a repeated warning about the use of the deficit, however measured. It is only a summary statistic: it hides as much as it reveals, and its value is directly related to the care with which it is used. This warning applies to the structural deficit, as we have argued, a number of false arguments have been made recently based on a misuse of the information contained in measures of current and projected structural deficits.<sup>35</sup> It also applies to our own concept of the “imprudent deficit,” which should be interpreted as simply providing one more piece of information on which to evaluate the expected consequences of current and projected deficits.

The design of a fiscal strategy involves combining these various pieces of information to arrive at an appropriate time path for the government’s fiscal instruments given the current and projected state of the economy and the commitment to short-run stabilization and long-run prudence. It is important to recognize in this regard that a budget cannot be judged in isolation; it is part of a sequence of budgets that make up a fiscal plan. What can be accomplished in one budget depends on what has been done (and promised) in previous budgets. This is perhaps obvious in terms of long-run fiscal prudence, but it is no less true for short-run goals; the impact of a fiscal change will depend crucially on the expectations that prevail and on the credibility of the fiscal plan implied by the budget.<sup>36</sup>

In discussing how to combine the various pieces of information, it is perhaps useful to consider the April 1983 budget. That budget was designed in the face of a sharp conflict between the needs for short-run stabilization and long-run prudence, and it illustrates a strategy appropriate to the conflict. The actual deficit had reached record proportions whether measured in current dollars, constant dollars, as a percentage of GNP, or whatever, and growing concern was being expressed about the exploding government debt. At the same time the economy was experiencing the most severe recession since the 1930s; forecasts for recovery were guarded at best, and fears of a rebound in inflation were wide-

spread. The response to this situation was “operation tilt”: modest current stimulus combined with an announcement of future tax increases. In effect there was an inter-temporally balanced budget change designed to address the perceived need for stimulus while not contributing unduly to the growth of the debt in the long run. Our calculations above suggest that the tilt was not steep enough to avoid a permanent run-up in the debt-to-GNP ratio, but nevertheless the budget clearly was designed to address the two issues, and in our mind it should serve as a model for other budgets. At the same time, for the tilt strategy to be made credible, the current government must honour the commitment made in the April 1983 budget. Ironically, the Progressive Conservative government appears committed to the strategy laid out in that budget; this will increase the viability of such strategies in the future.

## Appendix

### The Simple Arithmetic of Fiscal Prudence

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The measured deficit,  $D$ , is given by

$$D = G + iB - T$$

where  $G$  is government spending on goods and services,  $i$  is the nominal interest rate,  $B$  is the stock of interest bearing government debt, and  $T$  is tax revenues net of transfers. The latter is represented by a constant marginal tax rate,  $\tau$ , times disposable income,  $Y + iB$ , so the deficit can be rewritten as

$$D = G + i(1 - \tau)B - \tau Y \quad (1)$$

where  $i(1 - \tau)$  is the after-tax nominal interest rate.

The deficit equals the growth of the nominal value of government liabilities,  $L$ , which in turn is composed of interest bearing debt,  $B$ , and money,  $M$ :

$$D = \dot{L} = \dot{B} + \dot{M}$$

Let lower case letters indicate the corresponding upper case letter divided by trend GNP,  $Y^*$ . After adding and subtracting  $\tau Y^*$  in (1), we can write

$$d = (g - \tau) + i(1 - \tau)b + \tau \hat{y} \quad (1')$$

where  $\hat{y}$  is the GNP gap expressed as a fraction of trend GNP,  $(Y^* - Y)/Y^*$ . The first term is the “primary deficit” (as a fraction of trend GNP),

the second term is the debt-service component, and the last term is the conventional cyclical adjustment.

The debt accumulation consequences of (1') are that  $d$  will contribute to growth of real government liabilities  $\ell$  only to the extent that it exceeds the nominal growth in debt required to maintain a constant debt-to-GNP ratio. That is,

$$\dot{d} = \dot{\ell} + (\bar{n} + \bar{\pi})\ell \quad (2)$$

where  $\bar{n}$  and  $\bar{\pi}$  are the trend growth and inflation rates in the economy. Noting that  $\dot{\ell} = \dot{b} + \dot{m}$ , we recognize that in discussing these aspects of deficits, one cannot ignore monetary policy. For the purposes of this appendix we assume that the monetary authority absorbs just enough of the government deficit to maintain  $m$  constant; i.e.,  $\dot{M} = (\bar{n} + \bar{\pi})M$  so  $\dot{m} = 0$  and  $\dot{\ell} = \dot{b}$ . Hence we have

$$\dot{d} = \dot{b} + (\bar{n} + \bar{\pi})\ell \quad (2')$$

Combining (1') and (2') we get the basic equation describing the evolution of  $b$ :

$$\dot{b} = (g - \tau) + i(1 - \tau)b + \tau\hat{y} - (\bar{n} + \bar{\pi})\ell$$

Adding and subtracting  $(\bar{r} + \bar{\pi})b$ , and using  $\ell = b + m$ , we get

$$\begin{aligned} \dot{b} = & (g - \tau) + (\bar{r} - \bar{n})b - (\bar{n} + \bar{\pi})m + (r - \bar{r})b \\ & + (\pi - \bar{\pi})b + \tau\hat{y} \end{aligned} \quad (3)$$

where  $r = i(1 - \tau) - \pi$  is the after-tax real interest rate.

The first three terms constitute the permanent components contributing to the change in the ratio of government interest bearing debt to trend nominal GNP; the latter three represent transitory elements.

Fiscal prudence, as we define it, simply means that if the economy is on its trend path at target inflation rates (i.e.,  $r = \bar{r}$ ,  $\pi = \bar{\pi}$ , and  $\hat{y} = 0$ ), then any deviation of  $\ell$  from some target value  $\ell^*$  will vanish in the long-run. That is,  $\ell \rightarrow \ell^*$  as the economy grows in the steady state.

A sufficient condition is that when  $r = \bar{r}$ ,  $\pi = \bar{\pi}$  and  $\hat{y} = 0$ ,

$$\dot{\ell} = k(\ell^* - \ell), \quad k > 0 \quad (4)$$

(Note that by our assumptions on monetary policy,  $m^* = m$  implicitly so  $\ell^* - \ell = b^* - b$ .) We'll call equation (4) the (linear) prudence requirement and  $k$  (the speed of adjustment) the prudence factor. As  $k$  becomes large, fiscal prudence must be restored even faster, with  $k = \infty$  being extreme fiscal prudence.

Using (3) and  $\dot{\ell} = \dot{b}$ , we find that prudence imposes a constraint on the fiscal instruments such that

$$g - \tau + (\bar{r} - \bar{n})b - (\bar{n} + \bar{\pi})m = k(\ell^* - \ell) \quad (5)$$

Substituting (5) into (3) yields

$$\dot{b}^P = k(\ell^* - \ell) + (r - \bar{r})b + (\pi - \bar{\pi})b + \tau\hat{y} \quad (3')$$

where  $\dot{b}^P$  is the current rate of change in the debt ratio consistent with fiscal prudence as defined by equation (4). We can substitute (3') into (2') to get

$$d^P = k(\ell^* - \ell) + (r - \bar{r})b + (\pi - \bar{\pi})b + \tau\hat{y} + (\bar{n} + \bar{\pi})\ell \quad (6)$$

where  $d^P$  is the prudent fiscal deficit.

In our work we assumed  $\bar{r} = \bar{r}$  (probably okay for 1988 but not for 1984–85)  $\bar{\pi} = \bar{\pi}$  and chose  $k = \bar{n} + \bar{\pi}$  (thus eliminating the  $k\ell$  term). In this case we get

$$\begin{aligned} d^P &= k\ell^* + \tau\hat{y} \\ &= (\bar{n} + \bar{\pi})\ell^* + \tau\hat{y} \end{aligned} \quad (6')$$

We defined  $d - d^P$  as the imprudent component. The analogy to the structural deficit, which involves subtracting  $\tau\hat{y}$  and  $\pi\ell$  from the actual deficit, is apparent.

The above framework permits considerable generalization of our assumptions. One interesting case is to let the prudence function be non-linear with the rate of convergence depending on the deviation of GNP from trend. That is

$$\dot{\ell} = [k_0 - k_1\hat{y}](\ell^* - \ell) \quad (4')$$

where  $k_0, k_1 > 0$ . Then we can derive

$$\begin{aligned} d^P &= k_0(\ell^* - \ell) + (r - \bar{r})b + (\pi - \bar{\pi})b \\ &\quad + (\tau - k_1(\ell^* - \ell))\hat{y} - (\bar{n} + \bar{\pi})\ell \end{aligned} \quad (6'')$$

Since  $\tau - k_1(\ell^* - \ell) > \tau$  as  $\ell^* < \ell$ , this effectively increases the effect of transitory deviations of  $Y$  from  $Y^*$  on the prudent deficit (and reduces its effect on the imprudent deficit). Of course, if unrealistic values of  $Y^*$  are used, this undermines the fiscal prudence constraint.

## Notes

This study was completed in March 1985.

1. Although it is not an inevitable logical consequence of these two extreme positions, it is interesting to note that Neo-Keynesians consistently favour more fiscal expansion than do neo-conservatives.
2. We follow the standard convention of defining the FR measure to exclude foreign exchange requirements.
3. The effect of the inflation adjustment when consistently applied to NIA measured private and public saving is to raise public saving (i.e., reduce the deficit) and lower private saving. In our opinion this adjustment is appropriate whether or not the private sector “saves” the inflation premium. If the inflation premium is fully saved, planned private saving is not affected by the anticipated inflation rate; if not, planned private (not public) saving falls. This is shown accurately by the adjusted savings measures.
4. For further discussion, see the paper prepared for the Commission by Boadway and Clark (1985).
5. In what follows, we include bequests as an expenditure item. The present value of each series is the sum of its discounted flows where the discount factor is given by the after-tax interest rate facing the household.
6. We use the word “government” as synonymous with “the state” in this discussion.
7. In any given year the government could, of course, borrow to pay the debt service charges. It could not do this indefinitely when  $r > n$  because its interest commitments would grow faster than its revenues. This would create doubt that the government could raise the funds needed to pay that interest without monetizing the debt and creating an accelerating inflation.
8. See McCallum, B. (1983), Scarfe (1983), or Boadway and Clark (1985) for further discussion.
9. The government in this case is essentially acting as a financial intermediary. An important reason why households find themselves constrained in their ability to borrow is that their creditors will not be able to enforce fully any claim against future labour income. The government, with its general taxing authority, is better able to enforce such a claim, and under certain circumstances should play such a role.
10. For further discussion, see Barro (1979) and the paper by J. Bossons that follows in this volume (21) of the Commission’s research studies.
11. For example, when income falls households and firms may wish to borrow to maintain their level of spending, but many will find that they are limited in their ability to do so. The ability of households and firms to borrow in capital markets is sensitive to their current circumstances, in particular to their current income and immediate income prospects. Because of this restricted ability to borrow against future income, spending by households and firms will of necessity be linked to current income.
12. The stabilizing effects of deficits can be achieved either through discretionary tax and transfer changes or through automatic changes which result from the income dependency of the tax/transfer system. There is, of course, no guarantee that the benefits of discretionary counter-cyclical policy will be achieved; complications may arise due to lags and uncertainty. But in principle such benefits are possible.
13. An entity is legally bankrupt when the state decrees that its assets are to be distributed in the interests of its creditors. Obviously, this makes no sense when applied to the state itself. An entity is insolvent if it cannot make payments which it is legally required to make. The central government with its power to tax and create money is never technically insolvent.
14. The classic references are Modigliani (1966) and Diamond (1965). See also Modigliani (1983) and Boadway and Clark (1985).
15. This argument has especial relevance for the recent experience of the United States where a large deficit triggered a strong recovery in 1983–84, but has meant that the United States has changed from its historical position as a net creditor internationally to one of a large net debtor.

16. See the discussion in Bruce and Purvis (1983a).
17. This is nothing other than the crowding-out effect. Note that crowding out may be small or even negative during the recession that the deficit is counteracting. The main crowding out comes during and after the ensuing recovery. The resulting lower capital stock does not eventually lead to increased saving and investment since the government bonds accumulated via the deficit serve as substitutes in private portfolios for the "missing" physical capital.
18. In both cases, it is true that in an accounting sense the debt is "owed to ourselves," except of course that which is foreign held. The key point is that in the Ricardo world there are no further effects while in the non-debt-neutral world the effects identified in this and the previous section arise.
19. In a growing inflationary economy the budget need not literally balance on average; instead the average deficit would be dictated by the desired rate of growth of nominal government liabilities.
20. Because the costs of any future increases in the national debt implied by current fiscal plan are unlikely to be accurately foreseen by the electorate, governments can be tempted into seeking short-term political gains by offering current benefits with costs deferred and hidden through deficit finance. Moreover, avoiding these costs must be done through the political process since participants in capital markets will have no incentive to impose constraints on lending to the government.
21. Although the precise value for the optimum debt-to-GNP ratio cannot be determined, the basic "comparative statics" of the optimal debt ratio are known. For example, such comparative statics underlie recent work on social security and capital taxation. Further it would be straightforward to show, for example, that a resource discovery or a technological advance that raised future potential real income in the economy would increase the optimal current debt-to-GNP ratio while the newly anticipated depletion of an exhaustible resource would lower it.
22. An example from politics is the rule that an election must be called by a certain date. Political theory may suggest that there is an optimal tenure for a government yet the present state of our knowledge may not be such that a political scientist can tell us whether the present rule results in elections which are too frequent or infrequent. Nevertheless, an arbitrary tenure for a government is better than none; imperfect knowledge about the optimal tenure of the government does not justify unlimited tenure.
23. Another distinction that has received considerable attention in recent theoretical work is that between anticipated and unanticipated changes.
24. Sometimes the structural deficit is defined as the cyclically adjusted NIA deficit not adjusted for inflation. Since, as we have argued, the inflation adjustment is just an accounting correction it is not clear that such a calculation is of any use unless the inflation rate is very low. Throughout this report we will refer to the inflation-adjusted NIA deficit less the cyclical component as the structural deficit.
25. For this reason we argue below that for the purposes of evaluating fiscal prudence, the inflation adjustment should be made using a target inflation rate and a target stock of government debt. This ensures that, unlike the structural deficit, a fiscal plan is not presumed prudent by virtue of an undesirably high inflation rate or large stock of government debt.
26. For example, the structural deficit was negative (that is, in surplus) over the latter half of the 1970s, yet this period was one of a steadily rising ratio of debt to GNP.
27. In his conclusions to his study of fiscal policy for the 1967 Royal Commission on Taxation, Robert Will states: "The crucial test of the public's acceptance of the principle of counter-cyclical budgeting is its willingness to accept tax increases when the proceeds from such an increase are to be used to increase the size of the budgetary surplus."
28. As evidence on this, the cyclical adjustment calculated by the Department of Finance has been negative (that is, the cyclically adjusted deficit is smaller than the measured deficit) since 1971 and is projected to remain negative throughout the rest of the 1980s. By this definition of the cycle, the government budget would never be meaningfully balanced.

29. In essence we calculate the "prudent deficit" that which is consistent with maintaining a target debt-to-GNP ratio over the long run, given the projections for trend output growth in the economy, the target inflation rates in the future, and disregarding those components of the deficit that can be explained by transitory deviations of current output from the projected trend and transitory deviations of certain expenditure and revenue components attributable to other transitory events (such as the effect of temporarily high real interest rates on debt service expenditures). The difference between the actual deficit and this prudent deficit is defined as the imprudent deficit.
30. For further discussion, see Purvis and Smith (1985).
31. A detailed discussion of fiscal stabilization in Canada is presented in the study for the Commission by Purvis and Smith (1985).
32. We also have argued that some adjustment should be made for temporary fluctuations in real interest rates. Because of the difficulty we have not made such an adjustment although it seems clear that abnormally high real interest rates at the present time contribute to the deficit without affecting prudence.
33. As seen in Table 2-8, the corresponding calculations on a consolidated governments basis indicate a significantly smaller "imprudent" deficit. However, before drawing too much comfort from that, we note that owing to the provinces' limited taxing powers and access to capital markets, the test of prudence for the provinces may be considerably more stringent than those employed in the above calculations.
34. Elsewhere (Bruce and Purvis, 1983b), we also expressed doubts that fiscal prudence could be reconciled with truly discretionary stabilization policy in view of the informational requirements the two objectives would impose and the so-called "time inconsistency problem."
35. For example, a number of economists have argued, on the basis of the structural deficit, that the current and projected deficits are not a cause for concern and, if anything, there is room for a larger deficit in order to speed the recovery. Bossons and Dungan (1983) strongly support this view, as do Eisner and Pieper (1984), J. McCallum (1983), and F. Modigliani (1983).
36. For a more detailed discussion of these issues, see the study prepared for the Commission by Purvis and Smith (1985).

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In view of the importance and of the controversial nature of the subject examined by the authors, two discussants were invited to comment on this paper when it was presented to the Commission's Macroeconomics Research Advisory Group. The discussants were Professor John Bossons of the University of Toronto, who devoted particular attention to the adjustments that should be taken into account in measuring the extrapolatable level of the so-called "structural" deficit, and Dr. John Grant of Wood Gundy, Inc., who considered how the level of real interest rates should influence the choice of prudent levels of the deficit. Their papers follow.



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## Issues in the Analysis of Government Deficits

JOHN BOSSONS

### Introduction

Current controversies over the “true” size and effects of the government deficit need to be seen in a broader perspective. Too much of the recent debate about the deficit has been coloured by the journalistic device of personifying the issue as one of neo-Keynesians versus neo-conservatives. Although this colouration reflects one dimension of potential differences among analysts, namely, the relative weight given to long-run considerations in policy choices which involve inter-temporal trade-offs, it overlooks other important dimensions of the problem.

One of these is the degree to which the deficit is endogenous. Much of the journalistic debate assumes that the size of the cash-flow deficit is an exogenous policy-determined variable. Economists at least refine this assumption by noting the interrelationship between the government budget balance and macroeconomic conditions, focussing attention on the size of a “structural” deficit which is corrected for the effect of transient fluctuations in aggregate income and employment (and possibly other variables). But even economists generally assume this corrected deficit to be exogenous. At the extreme, e.g., Sargent and Wallace (1981) or McCallum (1983), the effect of a given government deficit is analyzed under the questionable hypothesis that it can be projected to remain the same fraction of GNP indefinitely into the future.

In actual fact, even the structural deficit is an endogenous variable within a political model of fiscal policy, so that “rational” expectations of future deficits should reflect knowledge of predictable political responses. Government policy decisions are influenced by political pressures linked to the size of the deficit, and this source of dynamic

feedback tends in the long run to keep deficits oscillating around zero. The nature and strength of this dynamic feedback effect is important to model. To assume that this political feedback is non-existent is obviously extreme.

Whether the structural deficit is viewed as endogenous or exogenous, it is important to measure it correctly. A second dimension of the analytic problem is whether transient fluctuations in economic variables other than aggregate income and employment should be taken into account in determining the true size of the structural deficit. This aspect is of particular importance in a small open economy, where fluctuations in real interest rates and key relative prices may both be exogenous and have significant effects.

The measurement of a structural deficit may have two different objectives. One is to differentiate between changes in the size of the government deficit that are endogenous within a macroeconomic model and changes that reflect conscious alterations of macroeconomic fiscal policy; the other is to evaluate the sustainability of government tax and expenditures policies in the long run. In the first context, a structural balance in government accounts (a zero structural deficit) may be regarded as the neutral position of an important macroeconomic policy lever. The second possible objective is to eliminate the effects of transient fluctuations in evaluating the sustainability of current tax/transfer/expenditure programs. In the latter context, a zero structural deficit may be taken to imply that the set of implicit social contracts embodied in current tax/transfer/expenditure programs are expected to be viable; a structural surplus implies the building up of an additional reserve.

There are subtle differences between the two consequent definitions of a structural deficit. Regardless of which is used, the underlying notion in each case is that such a measure provides better information about government fiscal policy than is provided by unadjusted data on current borrowing requirements. The reason for this is that the actual current deficit is too affected by transient changes to obtain much information about future government deficits beyond a very limited horizon.

In discussing how to measure the structural deficit, it is useful to analyze why it is socially beneficial that transients which affect government revenues and expenditures be reflected in swings in the deficit. Why should not the deficit instead be fixed (presumably at zero, as would be implied by a constitutional amendment requiring the government budget to be always in balance)? To answer this question requires some analysis of the costs and benefits of deficits and debt, which is done in the next section of this paper.

In the third and fourth sections, issues in the measurement of the structural deficits are discussed. The first of these sections deals with issues such as inflation, accounting methods, and transient influences. The second concentrates on evaluating the effect of underfunded gov-

ernment pension plans. The issues that arise with the latter are primarily concerned with the long-run viability of current tax/transfer/spending programs that affect inter-generational income redistribution. Because my primary purpose in this paper is to focus on the deficit as it affects macroeconomic policy, my comments in the fourth section are limited to the implications of underfunded public pension plans for macroeconomic policy analysis.

Defining and measuring the structural deficit is an exercise in positive economic accounting; its purpose is to shed light on the true state of fiscal policy. In the fifth section I turn briefly to the role of structural deficit measures in the determination of fiscal policy. A final section draws together conclusions and policy implications.

## **The Benefits and Costs of Deficits and Debt**

Before discussing analytic issues, it is worth reviewing briefly the costs and benefits associated with deficits and debt. The “benefits” of deficits arise from two sources: first, their usefulness in avoiding the instability in tax rates that would be required if the government budget were always balanced; and second, their contribution to stabilizing macroeconomic fluctuations. The “costs” of deficits arise in the longer run from the fact that deficits cause the public debt to be higher than it otherwise would be, reducing aggregate national wealth through displacing other potentially productive investments of private capital, increasing the impact of future tax distortions, or increasing indebtedness to foreigners. In the short run, perceptions of deficits as indicators of unsustainable government policy may generate additional costs. The magnitude and nature of both benefits and costs are affected in important ways by the openness of the Canadian economy.

In this section, long-term benefits and costs are discussed in the first two subsections. The short-term macroeconomic impact of deficits and debt are reviewed subsequently.

### ***Long-run Welfare Gains from Deficits***

Deficits are usually defended in terms of the benefits provided by their use as an instrument of counter-cyclical fiscal policy. (For example, in Bruce and Purvis [1985], the benefits potentially provided by deficits are described primarily in stabilization terms.) Nevertheless, it is useful to note that deficits provide an important source of long-run welfare gains even in the absence of stabilization impacts. They thus are beneficial even in the extreme versions of “rational expectations” frictionless macroeconomic models in which a fiscal policy that follows predetermined rules has no macroeconomic impact.

The benefits of deficits even in these extreme versions of “rational

expectations” macroeconomic models arise from their role in reducing distortions of inter-temporal resource allocation that would occur if tax rates had to vary from year to year to keep government budgets always in balance. It is an elementary public finance theorem that variations in tax rates applicable to different goods or activities cause welfare losses under most circumstances; see, e.g., Harberger (1964) and Sandmo (1974). These losses arise whether the variation is across goods and activities at a particular point of time or across different time periods. Economic efficiency is generally increased by policies which reduce either intra-period or inter-period variance in tax rates.<sup>1</sup>

In a world in which government fiscal policy was constrained by a constitutional requirement for a balanced budget, tax rates would have to vary to compensate for the effects on tax revenues of transient fluctuations in economic activity. (This means either that the demand for public goods is not otherwise affected by such transients or that the supply of public goods is difficult and/or costly to change in the short run. Both of these assumptions are realistic.) If predictable in advance, this inter-temporal variation in tax rates would induce individuals to change their labour supply and consumption decisions to reduce the total taxes paid over their lifetimes. If not predictable, the increase in risk caused by an unpredictable variation in the rates would also have distorting effects. Either way, social gains may be attained through using the government’s ability to borrow as a means of ensuring uniform tax rates. Where this is done, the deficit will (and should) vary to compensate for transient fluctuations in tax revenues and in transfer payments.

The rationale for deficits which has just been described is the basis for Barro’s “tax-smoothing” model of the time-series behaviour of deficits (Barro, 1979; 1984). Barro’s empirical work suggests that a considerable part of the inter-temporal variation in the U.S. deficit can even in recent years be explained by this simple model.

The time series behaviour of government deficits and debt that is implied by a tax-smoothing fiscal policy is worth noting. In a world in which all macroeconomic transients are purely random (in accordance with the extreme frictionless versions of “rational expectations” macroeconomic models), the ratio to GNP of the government deficit under such a policy will be a purely random stochastic process. The expected value of the government deficit will be zero in the absence of transients; realized values of the government deficit (expressed as a fraction of GNP) will be distributed randomly around this expected value. Since the government debt is simply the sum of current and previous deficits, changes in the government debt-to-GNP ratio will be purely random. The time series behaviour of the debt-to-GNP ratio will therefore be that of a random walk.

The random walk nature of the government debt-to-GNP ratio in a simple “rational expectations” macroeconomic model in which fiscal

policy follows a pure “constant tax rates” rule has important consequences. It implies that there will be long periods of time in which the debt-to-GNP ratio will stay higher than an arbitrary average or “prudent” value. It also implies that the best estimate of the future expected value of the ratio to GNP of the government debt is its current value. This second implication means that, at any time, the effect of past history is to endow future generations with an arbitrary level of debt, and that it is necessary to introduce deliberately a downward trend into the future random walk of the debt-to-GNP ratio if it is desired to reduce the expected value of this ratio in future periods.

Taking the long-run costs of debt, which are described next, into account implies that an optimal fiscal policy in a simple “rational expectations” frictionless world should modify the “constant tax rates” rule to yield an expected structural (transient-corrected) surplus, thus introducing a downward trend in the debt-to-GNP ratio. The magnitude of this planned surplus should be an increasing function of the size of the current debt-to-GNP ratio. In this world of purely random transients, with fiscal policy following either a pure or modified “constant tax rates” rule, neither current nor future transient deficits would be of concern. Rather, it is the legacy of all past deficits and surpluses, as reflected in the current debt-to-GNP ratio, which should affect fiscal policy.

### *Long-run Costs of Debt*

In discussing the costs of debt it is important to emphasize that it is indeed debt and not deficits which is important in the long run. Deficits matter only to the extent that they provide information about future changes in the debt-to-GNP ratio.

In a closed economy, the major long-run costs of debt arise from two sources. First, an increase in the government debt displaces other potentially productive investments of private savings.<sup>2</sup> This is reflected both in higher real interest rates than would otherwise have occurred and in reduced labour productivity. This well-known displacement effect of public debt is discussed by Modigliani (1961) and Tobin (1967). Second, a higher government debt-to-GNP ratio implies higher taxes in future years. Since taxes cannot be levied in a non-distorting manner,<sup>3</sup> the increased distortions created by the future tax increases associated with a higher debt-to-GNP ratio imply additional welfare costs.

It should be noted that, in a closed economy, it is the distorting impact of future tax increases and not their impact on income that has important consequences for the social cost of public debt. This is because income effects of the tax increases are offset by the transfers to bondholders which they pay for. If non-distorting “lump sum” taxes could be devised to cover debt service costs, the present value of the future reductions in private consumption caused by tax increases would in the aggregate be

balanced (at least as a first approximation) by the present value of increases in private consumption permitted by the transfers to bondholders. The tax increases and transfers would be redistributive, but the future macroeconomic consequences of the redistribution are of secondary importance.

The Canadian economy is of course an open economy, and so it is necessary to discuss how this openness affects the long-run costs of debt. The major effect is that higher government debt will largely result in increased foreign indebtedness rather than in a "crowding out" of private investment. This has two important consequences. First, an increase in the Canadian debt-to-GNP ratio will have little direct impact on real interest rates. Second, the income effect of future tax increases can no longer be assumed to be offset by transfers to domestic bondholders, since some of the tax proceeds will be paid out to foreign bondholders. Future tax increases will thus cause reductions in future domestic consumption.

Because Canadian assets are not perfect substitutes for foreign assets, the effects of an increased debt-to-GNP ratio must therefore be determined empirically. The extent to which productive domestic private investment is displaced by increased government debt depends on the elasticity of capital inflows with respect to interest rate differentials. Where this elasticity is high (as is the case for short-term government debt instruments), there is little displacement and little impact on real interest rates. However, it must be noted that debt management policies will affect the degree to which real interest rates change.<sup>4</sup>

Although the direct domestic crowding-out effect of government debt is of reduced significance in an open economy, the distorting effects of the future tax increases associated with a higher debt-to-GNP ratio may be higher once the openness of the Canadian economy is taken into account. This is because tax distortions can have a significant impact on behaviour in the international movements of capital and labour. The response of interregional or international factor allocation to tax differentials is potentially considerably greater than the impact of tax changes on total world factor supply.

Whether viewed in a world context (i.e., for a closed economy) or from a purely Canadian viewpoint (a small open economy), government debt is costly in the long run. Moreover, the social cost per dollar of debt is likely to be a rising function of the government debt-to-GNP ratio. First, the welfare loss arising from the distorting effects of future tax increases is likely (as a first approximation) to be a quadratically increasing function of the future tax increase. Second, because there is likely to be an increasing perceived risk of default even on sovereign government debt as the debt-to-GNP ratio increases, the debt service requirement per dollar of debt may also increase as the debt-to-GNP ratio rises. This would further increase the tax distortions arising from future tax increases.

# Stabilization Benefits of Deficits

The stabilizing benefits of government deficits have been well known since Keynes. However, the reasons for such benefits have become better understood in recent years through responses to the criticisms of Lucas (1976), Barro (1974), and others. In a closed economy, fiscal policy can have stabilizing impacts both through being unanticipated and through redistributing incomes to individuals whose spending is constrained by illiquidity or borrowing constraints.

In an open economy such as Canada's, the effectiveness of fiscal policy as a macroeconomic stimulant will depend on two additional factors: the extent to which this stimulus "leaks" outside Canada in the form of increased imports, and the extent to which increases in imports are permitted to reduce the foreign value of the Canadian dollar. Whether the Canadian dollar is allowed to fall in such circumstances depends on decisions by the monetary authorities.

Once the interaction between fiscal and exchange rate policy is noted, a number of possibilities arise. If the Bank of Canada does not intervene to prevent the dollar from falling, the effect of the lower value of the Canadian dollar may be to increase net exports in subsequent periods, thus spreading the stimulative effects of an increased deficit out over several years. If instead the dollar is held fixed (through sterilized intervention in the foreign exchange market), the stimulative effects of the deficit will exclude the future exports that would be induced by a currency depreciation. (Alternatively, of course, if the Bank of Canada contracted the supply of money to cause short-term interest rates to rise sufficiently to induce a short-term capital inflow, the higher interest rates would have a contractive impact on business investment and purchases of consumer durables that would offset the stimulating effect of a deficit.)

A macroeconometric model of the Canadian economy may be used to simulate the effects of a deficit under differing foreign exchange rate policies. For example, using the University of Toronto's FOCUS model, the change in real GNP induced by a deficit-financed unit change in real government non-wage expenditures has been estimated to have been as follows under conditions prevailing in the late 1970s.<sup>5</sup>

Exchange Rate Policy	Year 1	Year 2	Year 3
Floating	0.77	0.78	0.70
Held fixed	0.73	0.56	0.34

In both these examples, the money supply is assumed to be fixed and the increase in deficit-financed government spending is maintained over the three-year period. The increase in real GNP (and hence incomes and employment) is less than the increase in the deficit, partly because of

import leakages and partly because price increases induced by the rise in GNP subsequently reduce the competitiveness of Canadian exports and import-substituting goods. The effect of the induced price increases is of course greatest in the second case, where exchange rates are held fixed.

The impact of deficit-financed increases in government spending (or of deficit-financed tax cuts) is stimulative in an open economy, though the effect is not as great as in a closed economy. Real incomes and employment are both increased. Similarly, fiscal policy may be used to dampen an economic boom; the impact of a reduction in the deficit (whether through increased taxes or reduced government spending) will be to lower aggregate incomes and employment.

### *Effects of Perceptions of the Deficit*

While the short-run effects of changes in government deficits make them potentially useful in stabilizing the economy, these benefits may be offset if higher deficits lead business to perceive that investments may have become riskier. Regardless of whether such fears are justified, they are relevant if they lead to a reduction in business investment or affect other private behaviour.

A rational basis for such fears is that a seemingly chronic government deficit may indicate that the current set of government tax, transfer, and expenditure programs is not sustainable over the long run. Here of course what is really relevant is the long-term structural deficit, defined to measure the long-term sustainability of current government programs. A rise in this structural deficit signals that existing policies will likely have to be changed, thus creating uncertainty about which of the existing sets of quasi-entitlements and obligations will be affected. The possibility that the change may be an increase in business taxes may make business investment seem risky. Indeed, the uncertain incidence of future government responses to the non-sustainability of current programs will affect most private decision makers.

Unfortunately, the concept of the structural deficit is not widely understood among non-economists. The actual current deficit is often incorrectly interpreted as a good measure of the underlying structural deficit. The resultant potential for “deficit illusion” makes the task of fiscal policy design much more difficult, creating constraints that may rule out otherwise desirable fiscal policies. To reduce the inefficiencies arising from such constraints, it is important to find ways to ensure that increases in the deficit that are meant to be temporary are seen as temporary. Given the popular tendency to overemphasize the reported current deficit, the importance of making fiscal policy credible in this respect increases in any situation in which the current public sector borrowing requirement becomes high, even where the underlying structural deficit remains low.

One way in which the potential effectiveness of fiscal policy may be enhanced is through emphasis in public discussion of the differences between the structural deficit and the public sector borrowing requirement. Emphasizing the importance of correctly measuring the structural deficit may help reduce the incidence of deficit illusion and its associated social costs. How this concept should be implemented is the subject of the next two sections.

## Measuring the Current Structural Deficit

In this section, I focus on the impact of transitory economic phenomena on the government budget deficit. In “transitory” phenomena I include only fluctuations that occur within relatively short periods of time (e.g., within a ten-year span), ignoring variables, such as demographic change, that fluctuate over a longer time span. The impact of these long-term variables is discussed in the next section; they affect the viability of implicit social contracts regarding inter-generational redistribution, but can be regarded (in a first approximation) as unvarying over the duration of a business cycle. The long-term variables are thus not significant in evaluating the macroeconomic impact of short-term changes in fiscal policy.

It is now widely accepted, at least by economists, that it is necessary to correct for the impact of transitory phenomena in evaluating the magnitude of the public sector budget deficit. To do so presents the same sort of measurement problem that underlies the analysis of any income flow: to obtain an extrapolatable quantity that may be used for planning purposes, it is necessary to differentiate between “permanent” and “transitory” components of variation. The deficit measure corrected for transitory effects will be termed the structural deficit.

Although there is little controversy over the need to measure the structural deficit in order to evaluate changes in fiscal policy, there is substantial controversy over how to measure it. In this section, I will deal with seven of the issues under dispute: (1) correcting for inflation; (2) accrual versus cash flow accounting; (3) reflecting the direct impact of real growth on the debt-to-GNP ratio; (4) correcting for transient fluctuations in income and employment; (5) correcting for transient fluctuations in real interest rates; (6) reflecting the impact on average effective tax rates of changes in the rates of inflation and economic growth; and (7) dealing with transient fluctuations in terms of trade. Having done so, I shall then summarize the effects of all these adjustments by providing estimates of the current size of the true structural deficit in Canada.

In this section, I shall assume that the objective is to obtain a measure of what the deficit would be in a current year if normal circumstances prevailed. The nature of this measure — its relevance, as well as what it does *not* measure — is reviewed briefly first. I then turn to each of the

measurement issues noted above, providing empirical estimates of the appropriate adjustments where possible. Since this paper is in part a response to some of the arguments made by Bruce and Purvis (1985), I shall use their estimates where possible in order to emphasize the important points of difference.

### *Defining the Structural Deficit*

The essence of a structural deficit is that it measures the difference between current government expenditures on goods and services and the revenue yield of the current tax system (less transfer payments) under normal circumstances. Because the economy grows, it is necessary to express all these variables as ratios to GNP to make them comparable over time. A zero structural deficit is defined as a state in which the expected future value of the ratio of government debt to GNP is constant over the long term.

Four things should be emphasized. First, this definition of the structural deficit is a measure of the expected average future deficit (expressed as a ratio to GNP) which would be implied by continuation of all current government tax, transfer, and spending programs in unchanged form. This structural deficit will of course persist only so long as current government programs remain unchanged, and hence is a conditional expected value. Counter-cyclical fiscal policy may in this respect be viewed as a set of successive changes in tax, transfer, or expenditure programs which deliberately cause this conditional expected value to vary in the short term. For this reason, changes in the structural deficit provide a useful indication of changes in fiscal stimulus.

Second, this conditional expected value is, at least conceptually, the probability-weighted average present value of what the deficit would be under all potential circumstances.<sup>6</sup> That is, “normal circumstances” are interpreted as an average defined in this sense. Interpreted in this way, the structural deficit has clear implications for the long-run sustainability of current tax/transfer/spending programs as well as providing a measure of changes in fiscal policy.

Third, the notion of a structural deficit is simply an attempt to define a conditional expected deficit value in the long run. It has no normative significance; a zero conditional expected value should not be interpreted to imply anything in itself about either the “prudence” or appropriateness of fiscal policy.

Fourth, the structural deficit as defined here is a steady-state concept. The expected future value of the debt-to-GNP ratio is similarly the expected value in this steady state, and is not necessarily equal to the current debt-to-GNP ratio. In times such as the present (fall 1984), when autocorrelated transient shocks cause the cash flow deficit to exceed the structural deficit, the future steady-state debt-to-GNP ratio that is

implied by current government tax and expenditure programs will exceed the current debt-to-GNP ratio.

This definition of the structural deficit is essentially identical to that of Buiter (1983), although its implementation in this paper differs in some respects. In its simplest form,<sup>7</sup> the structural deficit is defined as

$$SD = G^* - (r^e - g) [EPV(T) - D]$$

where  $G^*$  is the desired long-run average ratio to GNP of government spending on goods and services,  $r^e$  is the expected long-term average real rate of interest,  $g$  is the average rate of growth of real GNP in the long term,  $EPV(T)$  is the conditional expected present value of current and future tax revenues net of transfers (evaluated at the real discount rate  $r^e$  and expressed as a fraction of GNP), and  $D$  is the expected average ratio to GNP of net public sector liabilities.

It should be emphasized that in this simplified formulation all relevant flows are specified in the form of real annuities that grow at the same rate as the expected long-term rate of growth of real GNP. This is appropriate, since this keeps all flows (including the structural deficit) constant when expressed as a fraction of real GNP, and thus in turn implies that a zero structural deficit is consistent with a constant debt-to-GNP ratio in a growing economy.

### *Correcting for Inflation*

The starting point in measuring the structural deficit is obviously to measure the actual current deficit. Following most other economists (see, e.g., Modigliani, 1983), I define this deficit to be the change in the real (inflation-corrected) magnitude of public sector debt obligations. Although the necessity for measuring such amounts on an inflation-corrected basis is not universally appreciated by non-economists, it should be obvious that failing to differentiate between real and nominal changes in the size of any outstanding debt (whether public or private) can substantially distort measurement. From the viewpoint of the Canadian public, the future debt repayment obligations of the Canadian government are meaningful only to the extent that they imply a potential reduction of real private consumption in future years. Any increase in the nominal public debt which is matched by a corresponding increase in the average prices of consumption goods and services will leave future real private consumption unaffected.

It should be noted that a consistent measurement system implies that all financial flows should be measured in the same way. This means that the inflation-corrected public sector borrowing requirement cannot be compared to a measure of aggregate private sector savings without ensuring that the latter is similarly corrected for inflation. Whether real

private savings rates are affected by inflation is a behavioural question that is independent of how real public and private savings rates should be measured.<sup>8</sup>

The necessary correction has been made by Bruce and Purvis in their estimates; it amounts to a reduction in the measured deficit equal to 1.4 percent of GNP.<sup>9</sup> Note that the correction reflects the actual inflation rate during a year (or the best estimate of it, if estimating a structural deficit before data are available).

### *Accrual versus Cash Flow Accounting*

The public sector borrowing requirement, whether or not restated in real terms, is purely a cash flow measure. It is customary to use the National Accounts deficit measure instead, on the ground that the latter is at least partly defined on an accruals basis and so (at least in part) ignores transient fluctuations arising from variations in the speed of payment of accrued taxes. It would be desirable to extend accrual concepts beyond those incorporated in the National Accounts.

I have elsewhere argued (Bossons and Dungan, 1983) that it is desirable to correct the National Accounts deficit by calculating the net revenue of all public pension plans on an accrual basis, and that if this cannot be done the cash surplus of public pension plans should be ignored in calculating the public sector deficit. Given the underfunded nature of the Canada and Quebec Pension Plans, it seems inappropriate to include their current cash surplus as a source of general government revenue. Removing this surplus from revenue increases the 1984 deficit of the total Canadian government sector by 0.8 percent.<sup>10</sup>

Because the effect of public pension underfunding is particularly relevant to the long-term viability of current implicit inter-generational redistributive arrangements, I shall defer further discussion of this issue to the next section. Accordingly, I shall in the remainder of this section adhere to the conventional assumption of the inflation-corrected National Accounts deficit as a starting point (modified by deducting the CPP/QPP cash surplus), and restrict further discussion to the impact of transitory economic phenomena on this variable.

### *Reflecting the Direct Effects of Real Growth*

Before discussing the impact of transients, one further correction is required. Because the structural deficit is defined as the real government balance (expressed relative to GNP) which would maintain the debt-to-GNP ratio at a constant level in the long run, it is necessary to allow for the direct effect on this ratio of anticipated real growth. To keep the average future debt-to-GNP ratio constant in spite of real GNP growth, it is necessary that the average deficit be greater than zero. In particular,

the average deficit (expressed as a ratio to GNP) must equal the product of the debt-to-GNP ratio and the expected average rate of real growth in GNP if the debt-to-GNP ratio is to be maintained.

Since the structural deficit is defined relative to this benchmark, the real public sector deficit must be corrected to reflect this. The correction consists of subtracting from the real current government deficit an amount equal to the product of the debt-to-GNP ratio and the expected real growth rate. At the current debt-to-GNP ratio, this correction amounts to approximately 0.5 percent of GNP.

### *Transient Fluctuations in Income and Employment*

The principle of making a cyclical adjustment to correct the deficit for the impact of macroeconomic fluctuations is widely accepted — more so, indeed, among non-economists than is the principle of measuring the deficit on an inflation-corrected basis. Nevertheless, how to implement a cyclical adjustment is the subject of much controversy among economists.

The appropriate correction is implied by the definition of the structural deficit, stated earlier. The conditional expected value of the deficit should be measured as a weighted average over all potential future levels of economic activity, where the weight associated with each level of activity reflects the probability of its occurrence in the long run. Since the “correct” cyclical adjustment thus depends on specifying this subjective prior probability distribution, economists agreeing on the conceptual definitions of both the adjustment and the underlying probability distribution may still differ in their assessment of probabilities.<sup>11</sup>

It is important to note that this definition of the cyclically adjusted deficit is *not* what the deficit would be at “full employment.” Nor, strictly speaking, is it what the deficit would be at an unemployment rate consistent with non-accelerating inflation, although that concept is closer to the correct “average”. For the United States, “full employment” probably means a current unemployment rate of approximately 6.3 percent (Bossons and Milne, 1985); Fair (1984) has estimated the “non-accelerating inflation” unemployment level in the United States to be 6.4 percent.

On the other hand, it is also important to note that the base reference level for the economy is a long-run average which may not be attainable for some time if the economy is, as at present, operating well below potential. It is possible that the expected long-run average unemployment rate for the economy may happen to be the same value as the unemployment rate which would be consistent with an unchanging inflation rate once all relevant expectations had become completely stabilized. Nevertheless, if the current unemployment rate is higher than the expected long-run average, it cannot quickly be reduced to the expected long-run average rate without generating inflationary pres-

tures. The term “core unemployment rate” will be used to refer to unemployment that would currently exist in the labour market without either positive or negative demand shocks. This core rate depends on prior macroeconomic conditions but, in the absence of additional shocks, gradually converges on the long run “natural” unemployment rate (Bossons and Milne, 1985). Under Canadian conditions in the fall of 1984, the average unemployment rate which is likely to occur in the long run is higher than the “natural” rate but considerably lower than the current core rate, implying above-normal unemployment rates over most of the remainder of this decade.<sup>12</sup>

The fact that aggregate incomes and employment may stay below their potential over a protracted period implies that a zero structural deficit may coexist with increasing values of the ratio of government debt to GNP over a similarly extended duration. This is simply a reflection of the “random walk” time series behaviour for the debt-to-GNP ratio which is implied by assuming debt transients to be a stationary process, in this case with autocorrelated rather than purely random shocks. The effect of autocorrelation is to lengthen the likely duration of periods over which a growing debt-to-GNP ratio may be associated with a zero structural deficit.

So as to err on the side of understating the size of the cyclical adjustment, I will use the more conservative of the two estimates presented in Bruce and Purvis (1985). This estimate implies adjustments amounting to 2.0 percent of GNP for the federal deficit and 2.7 percent of GNP for the consolidated deficit of the Canadian government sector.<sup>13</sup>

The Bruce and Purvis estimates just cited provide an indication of the extent to which the 1984 deficit was overstated as a result of tax revenue decreases and expenditure increases in that year that were endogenous to the business cycle. However, they exclude the effect of the offsetting increase in the structural deficit resulting from the predictable future increase in the debt-to-GNP ratio implied by the likely persistence of reduced output and high unemployment. This offset is estimated to amount to 0.2 percent of GNP for the federal government and 0.1 percent of GNP for the total government sector.<sup>14</sup>

The small magnitude of the offset might at first seem surprising. Its relative smallness results from the fact that it is the permanent “wealth” effect associated with the transient decrease in tax revenues (net of transfers). The cost of borrowing to replace this revenue is spread out over many years (to infinity, in the calculations used in this paper), and so is small relative to the size of the transient revenue decrease.

### *Transient Fluctuations in Real Interest Rates*

Two corrections discussed above have already allowed for the direct effects of inflation and expected real growth. The interest component of

the deficit remaining after the corrections is  $(r_t - g) D$ , where  $r_t$  is the current ex post average real interest rate paid on the government debt, after allowing for actual inflation;  $g$  is the expected rate of real GNP growth; and  $D$  is the current debt-to-GNP ratio. To arrive at the structural deficit as defined above, it is necessary to allow for the difference between  $r_t$  and  $r^e$ , the expected “normal” long term real rate of interest. This latter is obviously an ex ante real rate of interest, but is more relevant to the evaluation of long-run financing costs than the current transient-influenced ex post interest rate.

There have been substantial fluctuations over the past decade in the average ex post real interest rate paid on government debt. These fluctuations arise both from debt management policies (decisions regarding the maturity composition of the government debt), and from fluctuations in interest rates and inflation. In addition, the magnitude of these fluctuations also reflects a policy decision to keep all public debt issues denominated in nominal terms, so that unanticipated changes in inflation have also resulted in changes in ex post real interest rates.

With government debt contracted in nominal terms, the effect of fluctuations in the rate of inflation has been substantial. During the 1970s, unanticipated increases in inflation resulted in some years in negative ex post real interest costs on the government debt — one way in which governments “benefit” in the short run from accelerations of inflation. By contrast, actual ex post real interest rates rose to unprecedented heights during the disinflation of 1981–82, and have remained high since.

Another source of fluctuations in real interest rates arises from changes in the real yields required ex ante by investors. Partly because of the substantial volatility in the real yields realized ex post on government and other debt during the last decade, there has been a substantial increase in the risk premiums demanded by investors on long-term bonds. In addition, the particular combination of fiscal and monetary policy pursued since 1981 in the United States has resulted in high short-term real interest rates in North American capital markets.

One way of illustrating the sources of the current high level of real ex ante interest rates on conventionally denominated debt is to compare yields on differing maturities of indexed and conventional government debt instruments in the United Kingdom. In recent years, the British government has financed a substantial fraction of its borrowing requirements by issuing indexed debt, and there is consequently an active market in indexed as well as conventional bonds in that country. British indexed debt contracts eliminate for investors virtually all risks arising from unanticipated changes in inflation, so that the market yields on these securities include virtually no inflation risk premium. Since current macroeconomic conditions in the United Kingdom are broadly similar to those in Canada and since U.K. and North American capital

markets are highly integrated, the evidence provided by the yields on U.K. indexed bonds provides useful information on the term structure of ex ante real interest rates which might be expected to occur in Canada on government debt instruments if insulated from inflation risk.

In the fall of 1984, the yield structure of U.K. indexed bonds was a declining function of term to maturity. These yields imply that relatively high short-term real interest rates are expected to persist over the next five years (averaging about 5.7 percent), subsequently dropping to an average of about 3.5 percent over the following two decades.

The long-term real interest rate of 3.5 percent anticipated for the 1990s and beyond provides a relatively good estimate of "normal" real ex ante interest rates. As of fall 1984, current average ex post real interest rates on Canadian government debt are approximately 4.5 percentage points higher than this "normal" level. Since this deviation is temporary, estimates of the structural deficit are biased upwards if not correct for this transient.

The adjustment required to correct the estimated structural deficit for the effects of this transient is defined in a note to this paper.<sup>15</sup> The magnitude of the adjustment obviously depends on how long the temporarily high level of real interest rates is expected to persist. If expected to last only through the current year, the required adjustment would amount to the product of 4.5 percent and the current debt-to-GNP ratio. In fact, high real interest rates are likely to persist over an appreciably longer period. Assuming that the anticipations reflected in the yield structure of U.K. indexed bonds are correct, high real interest rates may be expected to persist until 1990. After allowing for the growth in the debt-to-GNP ratio which would result from this degree of persistence in high real interest costs, the adjustment amounts to approximately 0.9 percent of GNP.<sup>16</sup>

It should be noted that the assumptions underlying the estimated size of this adjustment include a presumption that either monetary policy will remain tilted toward erring on the side of disinflation, so that it is appropriate to expect the current inflation risk premiums on the long-term bond market to disappear, or that financial innovations such as the introduction of indexed bonds will permit government debt to be issued at a real interest cost which excludes an inflation risk premium.

### *The Effect of Inflation and Growth on Tax Rates*

Primarily because of the progressive nature and incomplete indexation of the tax system, the future growth of tax revenues (expressed as a fraction of GNP) which is implied by current tax legislation depends on the expected rates of inflation and real growth. The effect of inflation-induced future increases in tax rates is to raise the expected present value of tax revenues, and so to reduce the structural deficit (or increase

a structural surplus). Similarly, the progressive nature of the personal income tax results in similar increases in average effective tax rates being induced by higher real growth rates.

The effect of such future increases in effective tax rates is to raise the ratio of government spending to GNP that can be sustained in the long run. Consequently, expected inflation and real growth may result in a structural surplus even in circumstances in which the cyclically adjusted current real deficit is positive.

The adjustment required to reflect the likely future growth in the ratio of tax revenues to GNP is substantial.<sup>17</sup> For example, in the fall of 1984, expectations regarding inflation and growth are about 4.5 percent inflation and one percent growth in per capita real incomes. If it is assumed that the average elasticity of the entire tax system to both inflation and growth will average 1.1 over the next decade and thereafter fall to unity (so that inflation and growth only affect average effective tax rates over the next ten years), then the effect of 4.5 percent inflation and one percent growth in real per capita incomes is to reduce the current structural deficit of all governments (expressed as a ratio to GNP) by approximately 2.3 percentage points.<sup>18</sup> For the federal government alone, the effect of these assumptions is to reduce the federal structural deficit by 1.1 percent of GNP.

It should of course be emphasized that expectations regarding future inflation and real growth rates — particularly the former — fluctuate markedly, and that such changes can greatly alter the size of the “true” structural deficit. The substantial reduction in the expected rate of future inflation that occurred over the 1982–84 period has implied a correspondingly large increase in the structural deficit in the same period. Moreover, discretionary tax changes may offset the effect of inflation on tax rates. The uncertainty associated with predictions of future inflation implies that equal uncertainty must be associated with estimates of the “true” structural deficit. For this reason, it is appropriate to be cautious in predicting the potential elasticity of tax revenues with respect to inflation and growth.

### *Transients in the Terms of Trade; Resource Endowments*

Fluctuations in the terms of trade provide another source of exogenous transients in an open economy. Owing to the importance of the resource sector in Canada, Canadian incomes and tax revenues are subject to fluctuations caused by changes in the world prices of key commodities as well as by changes in resource endowments. Such fluctuations may be either transient or persistent. Where transient, their influence on government deficits should be eliminated. Where permanent, their effect should be reflected.

The most important transients of this type since 1970 are the results of

changes in world oil prices. Their effect on the deficit at the federal level has been moderated by government programs transferring increases in oil tax revenues back into exploration subsidies and subsidies to consumers. Their effect was more significant at the provincial level. At present, the actual net effect of transients arising from oil price fluctuations is not sufficiently significant to require adjustment of the structural deficits otherwise estimated, although this effect should be taken into account in measuring changes in the structural deficit over the past decade.

Other transients of this type result from fluctuations in important commodity prices that are caused by worldwide macroeconomic fluctuations.

Predictable changes in resource endowments may be important in the case of exhaustible resources such as oil. Were it not for the duration over which oil resources may be provided by the Alberta tar sands, it would be necessary to take account of the impact on tax revenues of the exhaustion of conventional oil reserves.

### *Does Canada Have a Structural Deficit?*

The implications of the adjustments described in this section for the overall size of the current structural deficit in Canada are pulled together in Table 1. As noted earlier, estimates presented in Bruce and Purvis (1985), have been used wherever possible to facilitate comparisons to their work.<sup>19</sup>

After making all the necessary adjustments, the estimates presented in Table 1 imply that Canada may not have a significant structural deficit at any level of government. Indeed, the consolidated position of all governments combined may be one of a significant structural surplus. Although this estimate depends on forecasts of inflation and real growth which may not be met, it is worth noting that the entire government sector would still show a structural surplus even if based on a forecast of only 2 percent inflation.<sup>20</sup>

Since this conclusion is substantially different from that reached by Bruce and Purvis, it is worth highlighting the sources of the differences. This is done in Table 2, which lists the adjustments made in this paper which are not reflected in the Bruce and Purvis estimates.

It should be noted that the estimates presented in Tables 1 and 2 do not take into account any of the important changes in fiscal policy made in the May 1985 federal budget. The announced tax and expenditure program changes imply a significant further reduction in the federal structural deficit.

### **The Long-term Viability of Government Pension Programs**

The estimates of the structural deficit presented in the previous section take no account of the incomplete funding of government pension plans,

**TABLE 1 Estimated Structural Deficits in Canada, 1984**  
(percentages of GNP)

	Federal Deficit		Consolidated Deficit, All Governments	
National Income Accounts deficit		6.3		5.3
Less: Corrections				
Correction for inflation	1.4		1.4	
Removal of CPP/QPP surplus	—		—0.8	
Restatement to reflect economic growth	<u>0.5</u>	<u>1.9</u>	<u>0.5</u>	<u>1.1</u>
Real growth-adjusted deficit		4.4		4.2
Less: Adjustments for transients				
Cyclical adjustment	2.0		2.7	
Less effect of cyclical debt buildup	—0.2		—0.1	
Effect of high real interest rates	0.9		0.9	
Transients in terms of trade	<u>—</u>	<u>2.7</u>	<u>—</u>	<u>3.5</u>
Transient-adjusted real deficit		1.7		0.7
Effect of expected inflation and real GNP growth on average tax rates		<u>1.1</u>		<u>2.3</u>
Structural deficit (surplus)		0.6		(1.6)

*Note:* These estimates are partly based on numbers in Bruce and Purvis (1985) to enhance comparability to estimates presented there. For sources of the estimates, see text and accompanying notes.

**TABLE 2 Comparison with Bruce and Purvis Estimates**  
(percentages of GNP)

	Federal Deficit		Consolidated Deficit, All Governments	
Bruce and Purvis estimate		2.9		1.2
Omitted corrections:				
Removal of CPP/QPP surplus	—		—0.8	
Restatement to reflect growth	0.5		0.5	
Omitted adjustments for transients:				
Offset for cyclical debt buildup	—0.2		—0.1	
Effect of high real interest rates	0.9		0.9	
Effect of inflation and growth on tax rates	<u>1.1</u>	<u>2.3</u>	<u>2.3</u>	<u>2.8</u>
Estimate in Table 1		0.6		—1.6

*Note:* The Bruce and Purvis estimates shown in the first line of the table are obtained by deflating their current-dollar estimates for 1984 (in Tables 2-5 and 2-6) by GNP (\$421 billion).

other than to exclude the current CPP/QPP surplus. If the structural deficit is defined for the purpose of measuring the viability of implicit intergenerational social contracts embodied in government transfer payment programs, then not taking account of the incomplete funding of government pension programs is a serious omission.<sup>21</sup>

Whether the degree of funding of government pension programs should be taken into account in analyses of current fiscal policy is a very different question. The transient influences on the government deficit discussed in the previous section are all relatively short-term in nature; it is unlikely that any of them would be projected to have a non-zero expected value in the mid-1990s. By contrast, the problems represented by the incomplete funding of government pension programs will only be beginning to be significant by then. Moreover, as U.S. experience with Social Security funding deficiencies in the 1980s indicates, such problems are perhaps more likely to be solved within the confines of pension program parameters (by reducing benefits or by increasing contribution rates) than through general tax increases.

From a macroeconomic viewpoint, it would consequently seem best to regard public pension funding as involving issues that are for the most part not directly related to those which concern current macroeconomic policy, and so to ignore pension funding issues in analyzing the current structural surplus or deficit.<sup>22</sup>

To emphasize this, I have elsewhere (Bossons, 1986) used the term “social contract deficit” to describe a deficit measure which takes public pension underfunding into account. The purpose of using this term is to emphasize that the focus of a measure which includes the effect of public pension underfunding is largely to evaluate the sustainability of the implicit intergenerational social contract which is embodied in current tax, transfer, and expenditure programs.

Calculating a “social contract deficit” in place of the structural deficit measure which is relevant for evaluating macroeconomic policy would lead to very different empirical results. In his June 1984 report to Parliament, the Chief Actuary of the Department of Insurance estimated that, under current benefit and contribution rates, the current balance in the Canada Pension Plan (CPP) fund would be exhausted in 20 years, at which time the current contribution rate would have to be doubled (and then subsequently increased by a further 50 percent) in order to maintain the current scale of benefit payments. The non-sustainability of the current CPP contribution and benefits rates is not reflected in the figures shown in Table 1. Although one could simply assume that the Canada Pension Plan is unsustainable in its present form and hence will have to be modified, it would be rash to assume that the required changes will be made solely by changing CPP contribution and benefits rates. To the extent that the emerging CPP deficit is not eliminated by increases in contribution rates, it may become necessary to increase general taxes in

order to subsidize the CPP scheme. The same caveats apply to the Quebec Pension Plan.

The potential for future diversion of general revenues to make up for cash deficits in the Canada and Quebec Pension Plans is a further reason for being cautious in incorporating all the estimated effects of inflation and real GNP growth on tax rates which are shown in Table 1 in the estimated structural balance for the total government sector.

## **Deficits and Macroeconomic Policy**

The analysis of the preceding two sections has shown that a good case can be made for the proposition that the consolidated accounts for the total government sector in Canada currently show a structural surplus after transient effects are allowed for, even before taking account of the tax increases and expenditure reductions announced in the May 1985 federal budget. Although the federal government had a small structural deficit in 1984, this was offset by a consolidated structural surplus for other levels of government.

Since this conclusion is at variance with popular perception and will accordingly be challenged, I should emphasize that the conclusion follows in qualitative terms once the transient nature of factors currently increasing the size of government borrowing requirements is recognized. The estimates reported in Table 1 are of course based on numerous specific assumptions. In particular, it is necessary to define the degree of transience of each temporary disturbance affecting the deficit. Other analysts making reasonable but differing assumptions would arrive at somewhat different estimates of the size of the structural surplus. Nevertheless, it would be difficult to specify a reasonable set of assumptions which would imply a qualitatively different conclusion.

The policy implications of this analysis are important because the conclusions imply — with two major qualifications — no need to increase taxes or reduce government expenditures for the purpose of bringing into balance the long-run fiscal position of the government sector. The first principal qualification is with respect to the funding of the Canada and Quebec Pension Plans, where substantial future changes will be required in benefit provisions and/or contributions. The second is with respect to the distribution of tax revenues between federal and lower levels of government, where aggregate federal transfers to the provinces would have to be reduced in order to bring the structural balance of the federal government into line with the consolidated structural balance of the total government sector.<sup>23</sup>

Given this conclusion, what are the implications for macroeconomic policy? At first sight it would appear that current government emphasis on reducing government borrowing requirements is based on a mistaken premise of a need to “bring the deficit under control.” (Such a con-

clusion might be correct in a world in which private decision-makers' expectations and actions rationally reflect economic models, including those models implicit in the preceding analysis.) However, the fact that the deficit is widely perceived to be a structural problem imposes constraints on government policy makers, regardless of whether such perceptions are valid. At a minimum, it is necessary on political grounds to appear to be undertaking action to reduce government borrowing requirements. Beyond this, as was noted in the second section of this paper, the fact that the deficit is perceived to be a problem implies that business and investor uncertainty will be increased if the government does not undertake such action in a credible way. The uncertainty created by popular perceptions of the deficit represents a depressing short-term influence upon the economy, which has to be taken into account by policy makers.

Apart from the perceptual problem, two other considerations lead to the conclusion that the appropriate long-term target for fiscal policy is not structural balance, but a structural surplus. First, as noted earlier, public debt imposes costs on society. As a result, social welfare is increased by reductions in the debt-to-GNP ratio, so that an optimal long-run fiscal policy almost certainly implies that government fiscal policy should on average yield a structural surplus, even assuming risk-neutrality on the part of policy makers. The size of the structural surplus should be an increasing function of the current debt-to-GNP ratio. Second, as was also noted, the future deficits (or surpluses) implied by any fixed set of government tax and expenditure programs are influenced by chance factors and hence are not predictable, so that the debt-to-GNP ratio implied by fixed policies is (approximately) a random walk. In this context, even a zero structural deficit is imprudent in the long run. Assuming that voters and policy makers are risk averse, it is appropriate to set a structural surplus as a long-run fiscal target in order to provide a reserve to reduce the social costs of unpredicted future shocks that increase the debt-to-GNP ratio.

Although the analysis of this paper indicates that the total government sector does not exhibit a structural deficit, it also indicates that it would be risky, particularly given the future problems created by the underfunding of the Canada and Quebec Pension Plan, to conclude anything more than that the total government sector is approximately in a state of structural balance. It consequently is necessary to make the long-run stance of fiscal policy more restrictive if the appropriate long-term target is a structural surplus.

Given all these considerations, the policy implications of this paper are that a moderate degree of fiscal restraint is appropriate from a long-term perspective. Current fiscal policy should thus be consistent with the attainment of a longer-run target of a structural surplus averaging perhaps one or two percent of GNP.<sup>24</sup> However, it should be strongly

emphasized that this does not imply that fiscal policy should be made more restrictive now. What it implies is that there should be a credible medium-term fiscal plan which is consistent with the longer-run target of a structural surplus.

One of the major current problems in fiscal policy design is to find credible ways of developing a medium-term fiscal plan which can include fiscal stimulus while remaining consistent with the longer-term target. In the context of a political environment where excessive attention is focussed on the potential dangers that would be associated with a high structural deficit and where many participants in the political process erroneously believe Canadian governments to be generating a high structural deficit, it takes substantial political skill to develop a fiscal plan that responds to the macroeconomic need for a temporary increase in the federal budget deficit during a time of high unemployment. Such a need is particularly acute if monetary policy is designed, for anti-inflation reasons, to err on the side of monetary tightness.

There are many alternative fiscal plans which are potentially consistent with a longer-term structural government surplus while providing current stimulus. The importance of credibility for the medium-term fiscal plan almost certainly rules out most forms of expenditure-based fiscal stimulus. However, it does not rule out temporary tax cuts, provided that these are specified in forms that are credibly temporary.<sup>25</sup> It should also not rule out more permanent tax cuts that can be shown to increase the rate of economic growth, especially where the additional growth may prove sufficient to generate future tax revenue increases whose present value offsets that of the revenue decreases due to the tax cuts.

## Conclusions

The conclusions of this paper are in some respects similar to those of Bruce and Purvis (1985). We agree on the importance of policy credibility and on the consequent importance of a credible medium-term fiscal plan. We also agree in urging policy makers to be risk averse. In other respects, however, our conclusions differ markedly.

In this paper, I have argued several propositions. First, it is useful and important to define a measure of long-run fiscal balance, so that the long-run fiscal implications of current government programs can be evaluated in a systematic way. Without such a measure, empirical fiscal policy analysis is adrift in a sea of arbitrary prejudice. Moreover, for such a measure to be useful, it must be defined in an objective manner.<sup>26</sup> The structural deficit measure defined in this paper is independent of subjective notions as to what fiscal targets may be desirable; it simply measures whether current tax and expenditure programs are consistent with a constant future steady-state debt-to-GNP ratio, whatever that ratio may be.

Second, in defining an accurate measure of the structural deficit, it is

important to take account of all transient factors that affect the size of the current deficit. One major reason for the differences between the empirical conclusions of Bruce and Purvis and those of this paper with respect to the size of the structural deficit is that their analysis of transient factors is less exhaustive.

Third, in setting a long-run target with which a current structural deficit should be compared, the target should reflect some judgment as to the optimal rate of decline of the debt-to-GNP ratio. Assuming the long-run costs of a dollar of government debt to be an increasing function of the debt-to-GNP ratio, there is no optimal debt-to-GNP ratio — only an optimal rate of decline in this ratio. Moreover, in view of the random walk nature of the stochastic process generating observed values of the debt-to-GNP ratio, the optimal long-run target structural surplus will necessarily vary over time.

Turning to empirical results, the conclusions of this paper are that the consolidated Canadian government sector is in a state of approximate structural fiscal balance. There are consequently no empirical grounds for the alarmist concern with the deficit underlying much popular comment. While I argue that the appropriate long-run fiscal target is a structural surplus, the empirical analysis in this paper provides no support for the view that fiscal restraint is appropriate in the short run.

## Notes

This study was written in November 1984 and revised in September 1985. It follows and is in part a response to the Commission's study by Neil Bruce and Douglas D. Purvis: "Consequences of Government Budget Deficits," the second paper in volume 21. "High Real Interest Rates and Fiscal Policy," by John Grant, also follows the Bruce and Purvis study.

I am indebted to Tom Wilson for suggestions and comments.

1. For inter-temporal constancy in tax rates to be optimal, it is necessary for household utility functions to be weakly separable between leisure and consumption and approximately homogeneous in consumption goods so that income elasticities of demand for consumption goods are approximately constant; see Sandmo (1974, p. 705).
2. This statement presumes that changes in public saving are not identically offset by changes in private saving, as would be implied by Barro's so-called "Ricardian equivalence theorem" (Barro, 1974). Reasons for presuming the irrelevance of Barro's theorem are set out in Bruce and Purvis (1985); see also Tobin and Buiter (1980), Modigliani (1983), and Abel (1985). Seater (1985) provides a useful review of the inconclusive empirical research on this issue.
3. This presumes that potential infra-marginal tax increases, (e.g., removing personal exemptions without changing marginal tax rates on currently taxed income) are politically unacceptable.
4. The substitutability between Canadian and foreign long-term debt is less perfect than for short-term debt because of the lack of long-term exchange markets.
5. See Jump and Dungan (1982), Table 1. The model version simulated is a "flexible prices" model in which markups increase in response to higher aggregate demand. It should be noted that the fiscal policy multipliers implicit in the FOCUS model are lower than in other Canadian macroeconomic models, largely reflecting greater price sensitivity in the model's international trade sector.
6. In practice, as measured in this paper, the structural deficit is really a conditional

expected value defined over a probability distribution which is censored to exclude events with very low probability such as a repeat of the deep depression of the 1930s. Unlikely possibilities of this type are better dealt with by specifying a long-term fiscal target that allows a reserve for such events, as advocated in the section on deficits and macroeconomic policy, rather than by attempting to reflect them in the assumed probability distribution underlying the measured structural deficit.

7. A more complete definition is provided in Bossons (1986). Note that the definition implicitly presumes a constant desired ratio of government expenditures to GNP. However, this is not restrictive since other presumed future growth paths for government spending can be converted into real annuities growing at the economy's growth rate which have the same present value.
8. As Bruce and Purvis (1985) have noted, the available evidence indicates that real private savings in Canada have not been reduced by inflation, so that the inflation component of the nominal deficit is in fact fully offset by an inflation-induced increase in nominal savings rates. (See, e.g., Jump and Wilson, 1985.) However, even if this were not the case, it would still be appropriate to measure the real government deficit on an inflation-adjusted basis. How the real private savings rate is affected by inflation and inflation-induced tax changes is an interesting theoretical and empirical question that has important implications for tax structure policies and long-run growth, but is independent on how the real present value of future taxes required to service the government debt should be measured, particularly in an open economy.
9. The Bruce and Purvis estimates are obtained from Table 2-3 of their paper, deflated by the 1984 GNP of \$421 billion to arrive at this figure.
10. The surplus contributed to general revenues of the government sector by the Canada and Quebec Pension Plans amounted to \$3.2 billion in 1984. Note that the Canada Pension Plan is treated as a government sector distinct from the federal government in the National Accounts.
11. Note also that there are alternative ways in which low-probability events may be treated; see note 6, above.
12. Some analysts (e.g., Lilien, 1982; Samson, 1985) have argued that the "natural" rate of unemployment is currently close to the actual current rate. Samson, for example, suggests that the "natural" unemployment rate in Canada was 11 percent in 1983. The issue is discussed at length in Bossons and Milne (1985); suffice it to say here that there are serious identification problems in the work of Lilien and Samson. Moreover, even if their analysis were correct, it would still be necessary for the purpose of the analysis in this paper to eliminate the effect of temporary fluctuations in their "natural" rate due to transient fluctuations in the variance of sectoral demand shifts.
13. The Bruce and Purvis estimates (in Tables 2-5 and 2-6 of their paper) are deflated by the 1984 GNP of \$421 billion to arrive at the figures used in this paper.
14. This estimate is based on the Bruce and Purvis estimates of the increases in the government debt-to-GNP ratios likely to occur in the period 1984-88. The size of the offset is overstated through not allocating some portion of these increases to the effect of above-normal real interest rates.
15. The adjustment to correct for temporarily high real interest rates (expressed as a ratio to GNP) is as follows after allowing for the previous correction for growth:

$$a/Y = (r_t - g)D - (r^e - g)V$$

where  $r_t$  equals the current average ratio of real ex post interest costs to government debt;

$r^e$  equals the expected long-term average real rate of interest;

$D$  equals the current debt-to-GNP ratio;

$V$  equals the present value of current and future debt service costs implied by persistence of the current transient in real interest rates, expressed as a ratio to GNP.

Discounting for growth as well as by  $r^e$ , the value of the ratio of  $V$  to  $D$  is:

$$V/D = w^T + \frac{r_t(1 - W^T)}{1 - w}$$

where  $w$  equals  $[1 + r_t - (r^e - g)]/(1 + r^e - g)$ ;

$g$  equals the expected long-term rate of growth of real GNP; and

$T$  equals the number of years for which the transient in real interest rates is expected to persist.

16. For the numbers provided in the text,  $r_t = 0.08$ ,  $r^e = 0.035$ ,  $g = 0.02$ , and  $T = 6$ . Given these values, the algorithm defined in note 11 implies that  $V/D = 1.88$ . Given a value for  $D$  of .27,  $(a/Y)$  is then 0.9 percent.
17. The magnitude of the reduction is approximately equal to the difference between the magnitude of a real annuity growing at the same rate as real GNP and the current cyclically adjusted level of tax revenues, where the former has the same present value as the real present value of current and future tax revenues. Expressing all variables as fractions of current real GNP, this difference is thus

$$d/Y = (r^e - g) PVT/Y - T^*/Y$$

where  $r^e$  equals the normal long-term real interest rate;

$g$  equals the expected rate of growth of real GNP;

$PVT$  equals the real present value of future tax revenues;

$Y$  equals current real GNP; and

$T^*/Y$  equals the current ratio to GNP of tax revenues.

Assuming that current expectations regarding price inflation and real growth may be extrapolated  $H$  years into the future, with continued growth expected subsequently but no further growth in effective tax rates, the ratio to GNP of the real present value of current and future tax revenues is

$$PVT/Y = (T^*/Y) \left( \frac{1 - v^H}{1 - v} + \frac{v^H}{r^e - g} \right)$$

where  $v$  equals  $[1 + (k_1 - 1)g^* + (k_2 - 1)p]/(1 + r^e - g)$ ;

$g^*$  equals the expected rate of growth of real per capita GNP;

$r^e$  and  $g$  are defined as above;

$p$  equals the expected average rate of price inflation over the next  $H$  years; and

$k_1$ ,  $k_2$  equal elasticities of real net revenues from taxes with respect to real per capital GNP and the price level (averaged over next  $H$  years).

This formulation assumes (conservatively) that there is no further growth in the ratio of  $T^*/Y$  beyond that projected over the forecast horizon  $H$ .

18. The assumptions reported in the text imply  $r^e = .035$ ,  $p = .045$ ,  $g^* = 0.01$ ,  $k_1 = k_2 = 1.1$ ,  $g = .02$ , and  $H = 10$ . These assumptions imply that  $T^*/Y$  grows from 0.34 to 0.36 over a ten-year period for all governments combined and then stays at this level. Using the algorithm set out in note 17, these parameter values imply that the ratio of  $PVT/Y$  to  $T^*/Y$  is 71.2. Since  $T^*/Y$  is .163 for the federal government and .342 for the consolidated

government sector, the value of  $d/Y$  is 1.1 percent for the federal government and 2.3 percent for all governments combined. Note that  $T^*$  is defined to equal total revenues less investment income and transfers from other levels of government; this net amount was \$39.1 billion for the federal government and \$89.9 billion for all governments combined in 1984.

19. In particular, the following are the same as in the Bruce and Purvis paper: the NIA deficit, the debt-to-GNP ratio (debt numbers based on the Bruce and Purvis NFVL series), the inflation correction, and the cyclical adjustment. The cyclical adjustment is the more conservative of two estimates published by the Department of Finance. All numbers are expressed relative to actual 1984 GNP (\$421 billion).
20. The effect of allowing for the reduced inflation-induced growth in net tax revenues is obtained by substituting  $p = .02$  in the calculations specified in note 18. The effect is to reduce  $PVT/T^*$  to 68.7 and so to reduce the adjustment to 1.0 percent of GNP for the consolidated government sector. The net effect of this change is to reduce the 1984 structural surplus of all governments combined to 0.3 percent of GNP.
21. I have argued this elsewhere (Bossons, 1986). The potential importance of the public pension underfunding problem is described in Hamilton and Whalley (1984).
22. The only relevance of public pension underfunding from a macroeconomic perspective is if investors' and business's perceptions of uncertainty-increasing deficits incorporate a perceived effect of such underfunding. Although capital market participants likely perceive public pension underfunding as a long-term problem, the overall effect of such perceptions is probably to increase private savings rates rather than to reduce investment.
23. Since federal transfers to the provinces amounted to approximately 4.6 percent of GNP in 1984, they would have to be reduced by about one-quarter in order to eliminate the federal structural deficit.
24. It should be noted that the popular notion of "balancing the budget over the cycle" corresponds with a long-run target specified as a structural surplus equal to the product of the current debt-to-GNP ratio and the expected rate of growth. Allowing for the expected increase in the debt-to-GNP ratio over the next few years, this would imply a structural surplus amounting to 0.8 percent of GNP as a long-term fiscal target for the total government sector in Canada.
25. The tax reduction proposals put forward in Bossons and Dungan (1983) were carefully framed to meet this criterion.
26. The subjectivity of the Bruce-Purvis concept of an "imprudent" deficit makes this concept of doubtful value for analytical purposes. Prudence is clearly a desirable characteristic of fiscal policy, but there is no scientific reason why it should be associated with either maintenance of the 1979 debt-to-GNP ratio during a period of high unemployment or choice of the 1979 debt-to-GNP ratio as a long-run target. Indeed, the analysis presented in this paper suggests that the long-run fiscal target should be a structural surplus even if the debt-to-GNP ratio were reduced to what it was in 1979, implying that the Bruce-Parvis target may actually be imprudent in the long run.

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## High Real Interest Rates and Fiscal Policy

JOHN GRANT

### Introduction

Interest rates in real terms were high in 1984. Long-term rates paid by the Government of Canada on bond issues that year averaged between 12-1/2 and 14 percent while the trend of inflation fell to the 4 percent range. Unless we assume that inflation is to be permitted to rise again, deficit financing has become an excessively costly policy. But a policy that contemplated increasing inflation would itself be imprudent. Thus neither the interests of taxpayers nor those of the country as a whole are well served by continuing to finance government outlays in this manner.

When the federal government runs a deficit, it must anticipate both that the postponement of taxes will make taxpayers better off, and that its own expenditures, at the margin, will yield more for the country than would reducing its debt. The former would be true if taxpayers could expect to invest the postponed taxes at a higher return than the rate at which the government accrues interest on its borrowing; the latter would be true if the marginal return to government outlays were higher than the interest rate the government must pay. I believe that in the circumstances of 1984 neither is true.

At any time, many, perhaps most, public and private expenditures do have a high payoff greater than the interest rate. But it is sobering to consider that real growth in net national income per capita has averaged since 1947 only 2.4 percent a year. This measure of the average real rate of return on society's capital reminds us that since we are constantly undertaking many outlays of sub-average as well as higher-than-average return, many activities, public and private, do not pass the interest rate test. The basic issue in my view is whether taxpayers' funds can be

profitably invested in social or private capital in the presence of a high real rate of interest. When international capital markets set a very high real interest rate, we are better off to invest abroad, or repay our outstanding foreign liabilities, than to create social or private capital in Canada! This point is just as valid for the government, acting for the collectivity of citizens, as it is for private individuals and firms acting in their own interests. What applies to the choice of outlays also applies to the choice of financing. For an individual or firm, the decision to acquire or pay down liabilities is based on the same criteria as the decision to acquire or sell assets. If real interest rates are high, the individual or firm can only justify net borrowing if the anticipated return on investment is even higher.

In the case of government, the decision to finance through debt rather than taxes is a decision to postpone taxes. It can only be justified if taxpayers can expect to be made better off as a result. If the real interest rate paid by the government is greater than the rate that taxpayers could earn by investing the postponed taxes, they would be better off if it levied the taxes and saved the interest on the national debt.

As stated so far, the argument is admittedly over-simplified. In particular, it would be wrong for the government to make massive, abrupt shifts in tax or expenditure policies on the basis of what might prove to be transitory conditions in international capital markets. Nor is it a simple matter to decide whether the rate of return on social and private outlays is likely to outweigh the cost of financing them. One of the hotly debated elements in the debate about deficits is the question of what rate of productivity growth we can reasonably expect in the future. Although average productivity, as measured by real net national income per capita, expanded at a 2.4 percent annually between 1947 and 1983, it grew 3.2 percent per year between 1947 and 1974, and only 0.1 percent between 1974 and 1983. The slowdown of the growth productivity surprised many who had become accustomed to the high rates of return earned on society's capital in the decades following World War II. Indeed, it is the repercussions from this shortfall in productivity which have finally brought the deficit front and centre on the government's financial agenda. It is no longer acceptable to set tax and spending priorities on the assumption that productivity growth will return to the trend set in the 1950s and 1960s. As tax revenues have fallen increasingly short of expectations and productivity has not rebounded sharply, a massive reconsideration is finally taking place.

The reconsideration would not have been a matter of such urgency were it not that other nations, and particularly the United States, are prepared to pay extraordinarily high real rates of interest for loan funds. Had worldwide real interest rates fallen, rather than risen, they would have left it a matter of some indifference to Canadians whether their government was tax or debt financed, and would have justified even

relatively low-payoff expenditures, whether public or private. Indeed, had real interest rates remained as low as they were in the early 1970s, the federal deficit would now be much less than it is: financing at high real rates has bloated the cost of servicing the outstanding debt. (Of course, if Canadians and their governments had been able to forecast accurately the course of real interest rates, fiscal policy would likely have been altered some time ago to a much more conservative stance.)

Nothing said so far is an argument for dramatic action. There are compelling reasons to take a measured approach to the fiscal problems facing the country. For one thing, the high real interest rates of 1984 may prove transient. They appear to reflect two elements of the environment that are likely to change over time. One is the fear of high and volatile inflation. Investors seem to demand high interest rate premiums today partly because they expect a recurrence of inflation. Sustained monetary restraint can prevent inflation, but many fear that Canadians are not really reconciled to the result of their low productivity. They fear that the bitterness of contention between the participants in the shrunken "economic pie" will lead to the demise of monetary restraint, as politicians vainly attempt to satisfy impossible demands. However, recent evidence on productivity gives some reason for optimism that the pie will grow again, although not back to the previous trend. It also can be argued that Canadians have learned from the experience of the 1970s to recognize and avoid monetary illusions. Be that as it may, the height of real interest rates probably reflects such fears, whether or not they prove justified.

Secondly, North American real interest rates undoubtedly reflect the indecision of the United States about its own fiscal strategy. Both Republicans and Democrats have proposed deficit-reduction policies, but so far the political process has not generated the compromises necessary to enact them. At the heart of this dilemma is the Americans' inability to come to terms with their own slump in productivity. U.S. President Reagan in particular has continued to act on the assumption that future real growth in net national product per capita will generate sufficient net revenue to balance the government's accounts and return the nation to financial health. However, the height of real interest rates reflects the financial market's judgment that this result is unlikely. In the meantime, the high rates increase the cost of procrastination. The longer a compromise is delayed, the higher the costs of servicing the nation's debt, and the greater the country's indebtedness to foreigners. In effect, the gamble on a restored productivity trend is becoming so costly that it is eating significantly into any gains that may ultimately be won. It is difficult to argue that the rejuvenation of U.S. industry will generate rewards sufficient to justify this impasse on the deficit.

The consequence of persistent high real interest rates to the U.S. financial structure, especially the banking sector, is particularly grave. The unproductive loans that still weigh down the balance sheets of many

banks must be financed at extraordinarily high costs in the deposit market. The threat of major bank failures is real. Of course, the untoward consequences of current real interest rates stretch far beyond North America. Probably the most damaging for the world economy as a whole is the virtual exclusion of Latin American and other third world countries from access to funds on reasonable terms. Many consider that the situation is close to a crisis, and that a change in U.S. fiscal policy must not be long delayed.

These and other considerations argue that today's extraordinarily high real interest rates are unlikely to prevail for much longer. However, we cannot prudently make policy on the optimistic assumption that they will disappear in short order. The worst case scenarios do not perhaps deserve great weight, but they deserve some; and there are many possible outcomes which imply heavy cost to Canadians if we maintain our present fiscal stance.

Nothing I have said argues for "balancing the budget on the backs of the poor." Indeed, the proper fiscal path is one which over its life is anticipated to put the country in the best position to deal generously with its disadvantaged. Right and left can unite on the proposition that the better we can create wealth, the better we can distribute it. The deepest criticism of present fiscal policy is that it represents for Canadians a set of choices which will more likely impair our earning power in the long run than enhance it. Nor does an argument for greater fiscal restraint mean that we should tolerate high unemployment. What is required is a compensatory monetary policy, not so stimulative as to rekindle inflationary pressure, but capable of maintaining the total pressure of demand at an appropriate level.

My argument does appear to suggest that we need a radical, not a gradual shift in the fiscal stance. Given the high real interest rates, should we not only cut the deficit but go all the way to a surplus? If we cannot generate a high enough real return on social investment to justify borrowing at today's real rates, then we should not be borrowing, at the margin, but lending. In fact, Canadians in the aggregate appear to have decided to do just that: in 1982 and 1983 and possibly again in 1984, we have run a surplus on our national balance of payments. In other words, we are exporting more than we import, using the difference to repay part of our international indebtedness. This is entirely owing to private sector action, however, since the federal government is a large net borrower, and the provincial and local government sector is roughly in balance.

Still, I think we must avoid precipitate action. Citizens have arranged their affairs in anticipation of certain tax and expenditure policies. The government should consult and deliberate before making moves that might wreck or seriously impair individuals' well-being. Only a high degree of certainty and consensus about the damaging consequences of inaction could justify highly dramatic change. It would be preferable to

establish a new multi-year fiscal plan, one which retains the flexibility to deal with surprises, but which firmly controls policy over time.

Bruce and Purvis have suggested using the debt-to-GNP ratio as a criterion for judging fiscal strategy. They have chosen an arbitrary target for the ratio, because they are unable to suggest an optimum level for it. The measure has some merit. In a situation where the social return on investment is less than the real interest rate, then persistent government borrowing will result in an increasing debt-to-GNP ratio, since the country's taxable income will not grow as rapidly as the interest burden of the debt. Such behaviour by a private borrower would terminate in bankruptcy. In the case of the federal government, bankruptcy is impossible, but, if the government attempts to escape its high real interest costs by printing money, a likely outcome is inflation and a progressive breakdown of social and political consensus. In this argument, Bruce and Purvis have identified a symptom of an irresponsible fiscal policy: if pursued under likely assumptions as to real interest rates and national productivity, such a policy will produce a rising debt-to-GNP ratio. What makes a particular fiscal policy imprudent, however, is not the achievement of a particular debt-to-GNP ratio, but the decision to direct social resources in an inappropriate direction.

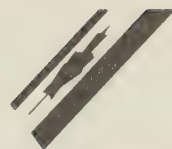
Bruce and Purvis rightly point out that the oft-heard argument that we owe the debt to ourselves is invalid. It is not the distribution of income from borrowers to lenders which is in question, but rather the implication that fiscal policy is making us all worse off. Even if the federal debt were entirely held within Canada, so that the question of foreign indebtedness did not arise, the problem of inefficient resource use would remain.

In summary, I believe the best criterion for judging the prudence of fiscal policy is a comparison between the real rate of interest and the rate of return that can be anticipated on social or private investment. Both measures, although difficult to estimate, are easy concepts to grasp. Under present circumstances, the job of maintaining adequate demand in the economy should be delegated more to monetary policy, since the Bank of Canada can take steps to ensure that increased fiscal restraint is compensated to provide reasonably stable, non-inflationary economic growth. The primary requirement today is for a fiscal plan that properly recognizes the extraordinary and punishing consequences of high real interest rates.

## *Note*

This study was completed in December 1984. It follows and is in part a response to the Commission's study by Neil Bruce and Douglas D. Purvis: "Consequences of Government Budget Deficits," the second paper in volume 21. "Issues in the Analysis of Government Deficits," by John Bossons, also follows the Bruce and Purvis study.





# The Theory and Practice of Monetary Policy in Canada: 1945–83

GORDON R. SPARKS

## A Framework for Analysis

The purpose of this study is to review the performance of monetary policy in Canada since 1945. We begin by outlining a theoretical framework for analysis and then proceed to a chronological examination of policy developments. Changes in both the theoretical underpinnings of monetary policy and the institutional environment in which it took place after World War II are also considered.

To set the stage for an evaluation of policy, we first outline in a nontechnical way the elements of a theoretical framework, beginning with the basic building blocks of a simple short-run macroeconomic model of an open economy.

## *The Model*

### THE FINANCIAL SECTOR AND AGGREGATE DEMAND FOR GOODS AND SERVICES

The interest rate and the level of real output are assumed to be determined in the usual IS/LM model, in which the demand for real balances is a function of real output and the nominal rate of interest; aggregate demand for goods and services is a function of output, the real rate of interest and fiscal policy; and equilibrium conditions equate money demand with money supply and aggregate demand with output.

The use of this framework is not intended to restrict the channels connecting monetary policy to aggregate demand to a single interest rate; rather, the interest rate simply summarizes a variety of such chan-

nels. There are, of course, different views on the nature of the transmission mechanism. The *Report of the Royal Commission on Banking and Finance* (1964, p. 423) summarized these as follows:

One such view tends to put considerable emphasis on the supply of money and stresses the broad parallelism between the stock of money and such variables as consumer spending and economic activity generally, price levels and interest rates. A second approach lays stress on the supply of a broader range of financial assets than those which qualify as “money,” on the grounds that no sharp distinction can be drawn between chartered bank deposits and their close substitutes — the deposits of competing institutions, savings bonds and (for large investors) money market paper. Proponents of this view thus see a powerful connection between spending decisions and the supplies of a broad range of liquid assets.

## THE DISTINCTION BETWEEN INTERNATIONALLY TRADED AND NONTRADED GOODS

Since Canada is an open economy and a relatively small participant in many international markets, it is useful to disaggregate output into nontraded goods, which are produced in Canada but are not traded internationally, and traded goods, whose prices are determined in international markets and can be influenced only to a limited extent by Canadian producers.<sup>1</sup> Clearly, natural resources dominate the latter group.

The price of traded goods relative to that of nontraded goods is an additional factor influencing the aggregate demand for domestic output. It is determined by the domestic prices of nontraded goods, the prices of traded goods as determined in international markets in terms of foreign currency, and the exchange rate, which translates the prices of traded goods into domestic currency. An increase in the relative price of traded goods brought about, for example, by a depreciation of the Canadian dollar, will shift domestic demand from traded to nontraded goods, but will have an insignificant effect on total world demand for traded goods, so that it will lead to an increase in the total demand for domestic output.<sup>2</sup>

## INTERNATIONAL CAPITAL MOBILITY AND THE INTEREST PARITY CONDITION

The constraints imposed on domestic interest rates and monetary policy by international movements of capital can be conveniently represented by the interest parity condition; this states that the returns on assets denominated in different currencies will be equalized after the effect of

expected changes in the exchange rate is taken into account. More precisely, the condition is:<sup>3</sup>

$$\text{domestic interest rate} = \text{foreign interest rate} + \text{the expected future rate of depreciation of the domestic currency}$$

This relationship implies that there will be very little scope for an independent monetary policy under a fixed exchange rate regime, such as we had in Canada in the 1960s. Under a fixed rate, the domestic interest rate will be tied to foreign rates and changes in monetary policy will primarily affect the level of foreign exchange reserves rather than credit conditions. Under flexible exchange rates, on the other hand, monetary policy can affect both interest rates and the exchange rate. The relative impact on these two variables will depend on the response of exchange rate expectations.

## REAL VERSUS NOMINAL INTEREST RATES

As indicated above, it is the real interest rate (defined as the nominal rate minus the expected rate of inflation) that affects aggregate demand, but the interest parity condition holds in terms of the nominal rate. If the rate of inflation increases and the new higher rate is expected to continue in the future, there will be a corresponding increase in the nominal rate of interest. This is consistent with the interest parity condition, since an increase in the domestic inflation rate will lead to an increase in the currency's rate of depreciation.<sup>4</sup> The substantial differences in nominal interest rates that occur in different economies can be explained largely by differences in inflation rates.

## THE INFLATIONARY PROCESS

The major mechanisms determining the price level and rate of inflation in an open economy are as follows:<sup>5</sup>

1. In international markets, the price of traded goods is determined in foreign currency and is then translated into domestic currency via the current exchange rate. Thus, if the domestic authorities attempt to peg the exchange rate, changes in foreign prices will be transmitted directly to the domestic price level. Conversely, under flexible exchange rates, it may be possible to insulate the domestic price level from fluctuations in foreign prices.
2. The price of nontraded goods depends on wage rates and demand (as determined by the variables listed above).
3. The price of domestic output (the GNE deflator) and the Consumer

Price Index are determined as weighted averages of the prices of traded and nontraded goods; the weights are determined by the respective proportions in production and consumption.

4. Wage rates depend, with a lag which is determined by the pattern of wage contracts, on the expectations of future prices at the time the wages were negotiated. Failure to anticipate increases in the inflation rate will lead to catch-up increases in wages when new contracts are negotiated. Wages also depend on the degree of slack in the economy, measured by how far actual output deviates from the potential full employment level.

This relationship determines the short-run trade-off between inflation and unemployment and the inertia in the adjustment of the rate of inflation to changes in monetary variables. In the long run, when expected and actual inflation rates are equal, the trade-off disappears and the unemployment rate settles at the “natural rate.”

Because of the lags in the adjustment of wages and prices to changes in aggregate demand, fluctuations in the money supply (under flexible exchange rates) will have short-run effects on the level of real output. However, the ultimate long-term effect of an increase in the money supply will be a proportionate increase in the price level and a depreciation of the currency. An increase in the *rate of growth* of the domestic money supply relative to the rest of the world may lower interest rates and stimulate real output in the short run, but will eventually lead to increases in the rate of inflation, in nominal interest rates and in the rate of depreciation of the currency.

## *The Objectives of Macroeconomic Policy*

### POLICY OBJECTIVES AS A REFLECTION OF SOCIAL PRIORITIES

The *Report of the Royal Commission on Banking and Finance* (1964, p. 398) summarized the main objectives of macroeconomic policy in these words:

We believe that Canadians would now agree that the following four very broad economic objectives should be pursued by the authorities and the nation generally:

- (a) Rising productivity;
- (b) A high and stable level of employment;
- (c) Stable prices;
- (d) A sound external financial position.

The Report went on to examine the conflicts that are likely to arise in the pursuit of these goals and the difficulties of achieving a consensus

concerning priorities. A full discussion of these issues is beyond the scope of the present study.

## THE ROLE OF THE MONETARY AUTHORITY

A long-standing issue concerning the role of monetary policy in achieving the objectives of macroeconomic policy has been the desirable degree of independence of the monetary authority. The *Report of the Royal Commission on Banking and Finance* (1964, p. 540) said about this:

It does not necessarily follow that because the Bank [of Canada] is a policy arm of government it should be made a department of government. Indeed most of the world's 100 central banks — apart from those in totalitarian countries — are separate institutions in fact as well as in form precisely because experience has shown that the objectives of society can best be met by an arrangement which leaves some measure of independence to the monetary authority.

The Report went on to recommend that the monetary authority be given a degree of independence for the following reasons (1964, pp. 541, 542):

Those engaged in financial affairs. . . look to an independent central bank as a guarantee that market dealings are not being undertaken for day-to-day political considerations unrelated to the broad aims of monetary and financial policy. . . . The central bank also has an important responsibility to encourage the development of an efficient and flexible financial system to serve the needs of the economy as a whole as well as the special requirements of the policy makers.

[There has been a] historical tendency of governments of all forms to develop the habit of inflating the currency. Since the process of inflation is understood by relatively few people and since it has few other organized opponents in our society, a special responsibility is imposed on the central bank to see that the objective of price stability is not forgotten by government merely because other goals have more political popularity in the short-run. . . . It is only realistic to recognize that government might occasionally be tempted to use the monetary system in an inappropriate way to finance its requirements through the hidden and discriminatory tax of inflation rather than through taxes. . . .

[A] measure of independence strengthens the central bank when exercising its right and responsibility to try to bring about the most appropriate "mix" of government policy. . . . The expert advice of a central bank not dominated by fears of short-run political pressure leads to more carefully considered policies. . . .

It can be argued that this last consideration has become of even greater importance in the twenty years since the commission's report was published, during which time the Bank of Canada has taken a leading role in the fight against inflation.

H.S. Gordon has been a leading dissenter from the view that the central bank should have a measure of independence, calling it a “gross incongruity in a parliamentary democracy based on the principle of executive responsibility” (1961a, p. 1). Gordon argues that in exercising its responsibility to pursue macroeconomic stabilization, the Bank of Canada must make choices concerning the weights to be given to the various policy objectives. The Bank is thus a “policy-making and policy-implementing body, [whose] actions are actions of governing” (1961a, p. 16). He rejects the argument that central bank independence is desirable to protect the currency’s value on the grounds that appropriate fiscal and other policies may at times be unpopular, but this is not a reason to abandon responsible government.<sup>6</sup>

H.S. Gordon also suggests that the central bankers’ desire for independence is based more on their wish to avoid public scrutiny and accountability than on any argument that such autonomy is necessary for effective functioning. This theme is taken up by Chant and Acheson (1972) in their analysis of the behaviour of the Bank of Canada; they employ a theory of bureaucracy that focusses on prestige and self-preservation as goals that influence behaviour, arguing that central banks tend to prefer covert modes of operation. As evidence, they cite the Bank of Canada’s extensive use of moral suasion and its employment of a variety of instruments for monetary control, including transfers of government deposits between the chartered banks and the Bank of Canada.

### *Regional Aspects of Monetary Policy*

In a regionally diverse economy such as Canada’s, there is bound to be controversy over the effects that the dominance of large national financial institutions has on regional economic activity. There are three broad areas of concern.

#### REGIONAL BIAS IN THE FINANCIAL SYSTEM

It is often argued that there are biases in Canada’s financial system that impair the availability of funds to meet credit requirements in the western provinces and in Atlantic Canada. In a paper prepared in 1973 by the Government of Canada for the Conference on Western Economic Opportunities, this issue was addressed as follows (p. 47):

The lack of data makes it virtually impossible to develop reliable estimates of overall savings and investment by province or region. . . . What is clear is that inter-provincial and inter-regional flows do occur. . . . Such flows are an essential part of the national, and indeed international, capital market. To suggest that savings accruing within any one area of the country ought necessarily be reserved for use only within that same area would be as

destructive of the concept of a common market within a country as would barriers restricting the movement of people and goods across provincial boundaries.

## REGIONALLY DIFFERENTIATED MONETARY POLICY

Since the Bank of Canada's primary function is to regulate the supply of money and credit in a nationally integrated capital market, it has limited scope for differentiating among regions. In our view, special financing problems of poorer regions should be addressed through specific programs, such as those designed to assist small businesses. Monetary policy should be directed at national credit markets, although regional economic conditions can be relevant to policy decisions.

## REGIONAL EFFECTS OF EXCHANGE RATE CHANGES

Monetary policy will have a strong influence on the exchange rate under a flexible rate system. Fluctuations in the exchange rate in turn influence the domestic economy via changes in the relative price of traded and nontraded goods. For example, a contractionary monetary policy will cause the external value of the Canadian dollar to rise and the domestic price of traded goods to fall. The restrictive effect on domestic production operating through the exchange rate will be concentrated in natural resource industries and so will have a greater effect on regions outside central Canada that are relatively specialized in resources.

This problem represents an important limitation on the usefulness of monetary policy in a regionally diversified open economy. The key to dealing with it is an appropriate mix of monetary and fiscal policy that balances the impact of restrictive monetary policy on the traded goods sectors with overall restraint provided by tax increases or reductions in government expenditure.

### *Targets and Instruments of Monetary Policy*

In a deterministic world in which the operation of the economic system was fully understood, the operation of monetary policy would be a simple mechanical process once a decision had been made on the weights to be attached to conflicting objectives. The actual situation facing policy makers is a very uncertain one. The uncertainty is of two kinds. First, there is incomplete knowledge (as well as disagreement) concerning the structure of interrelationships that make up the economic system and the time lags involved in behavioural responses. Second, there is at any time a myriad of factors impinging on the economy that cannot be accurately identified or predicted. These are generally referred to as "disturbances" or "shocks."

The operation of monetary policy in the face of the latter kind of uncertainty was analyzed in a seminal article by W. Poole (1970).<sup>7</sup> In his view, the problem is seen as the choice of the most appropriate policy instrument. Such an instrument is defined as a variable, e.g., bank reserves, money market interest rates or the exchange rate, over which the policy authority has more or less direct control, at least in the short run. Because of the relationships that exist among the variables, the central bank can control no more than one; it must allow the others to adjust to disturbances. The choice of the appropriate variable to hold constant is known as the “instrument problem.”

The solution to the instrument problem depends on the relative importance of disturbances to the goods markets, financial markets and the balance of payments. For example, a money market interest rate will be the appropriate instrument if the main source of disturbance is in the money demand or money supply relationships. Controlling the interest rate will cause financial disturbances to be absorbed through changes in base money and so prevent their transmission to expenditure decisions via changes in interest rates and credit conditions. Pegging the exchange rate will also provide insulation from domestic money market disturbances, except when foreign interest rates are the source of disturbance.<sup>8</sup>

When goods markets are the main source of disturbance, it will be preferable to fix a monetary aggregate, such as bank reserves, and allow interest rates to vary and act as stabilizers. In general, it will be optimal to pursue a combination policy under which both interest rates and bank reserves vary in response to disturbances, but in practice it is difficult to determine the weights that should be attached to different instruments.

The problem of choosing an intermediate target of monetary policy arises from uncertainty and lags in the receipt of information about the variables (e.g., output and the rate of inflation) that are the ultimate targets of policy. During the 1970s many central banks, including the Bank of Canada, shifted their intermediate target from interest rates and credit conditions to monetary aggregates. This issue is taken up in some detail further on.

## **The Evolution of Active Countercyclical Policy, 1945–54**

### ***Transition to Peacetime***

Monetary policy in the early postwar years reflected two main considerations.<sup>9</sup> First, thinking was heavily influenced by memories of the Depression and the difficulties of making a transition to a peacetime economy. It was feared that the winding down of defence production would create deflationary pressure once the immediate backlog of demands for nondefence goods had been met. Consequently, there was a willingness to pursue expansionary monetary and fiscal policies,

although fiscal policy was not particularly expansionary.<sup>10</sup> Second, during the war, interest rates had been pegged to accommodate the government's financial requirements and there was a reluctance to permit bond prices to collapse, as they had after World War I.

In the event, after a slowdown in 1949, the economy expanded rapidly in response to strengthening U.S. demand for natural resources. A further sharp stimulus was provided by the outbreak of the Korean War in June 1950. Prices of many internationally traded commodities rose sharply, although by early 1952 the inflationary pressures had eased. During this period, there was considerable upward pressure on the Canadian dollar, which had been revalued from 90.5 to 100 U.S. cents in 1946, and then back to 90.5 U.S. cents in 1949. In 1950 there were substantial speculative capital inflows and, because of the difficulties of determining a suitable level for a fixed rate, a floating exchange rate was adopted.

During this period, the Bank of Canada made a gradual transition to an active monetary policy. Watts (1976, p. 4) states that there was:

. . . a growing realization within the Bank that the economic environment had changed significantly and that inflation was at least as likely to be a problem in the future as insufficient demand. This readjustment in thinking was one which occurred gradually. In Canada, as in most countries, there continued to be a bias towards low and relatively stable bond yields . . . However, the Bank of Canada for the first time in its history moved to a restrictive monetary policy, though it did so cautiously and in conjunction with the use of moral suasion.<sup>11</sup>

Stabilizing the bond market continued to be a policy objective, but it was recognized that pegged interest rates and anti-inflationary monetary restraint were inconsistent. The policy of rigidly pegging bond prices was therefore abandoned in early 1948, and the first postwar increase in the bank rate was made in October 1950, at the same time as the floating exchange rate was introduced.<sup>12</sup>

## *Institutional Changes*

### DEVELOPMENT OF THE MONEY MARKET

During the early 1950s important institutional changes were introduced to facilitate the operation of monetary policy.<sup>13</sup> The absence of an active domestic money market was hampering the ability of the Bank of Canada to pursue monetary control through the open market, and steps were taken in early 1953 to broaden the market for treasury bills and other short-term paper. In particular, the Bank encouraged investment dealers to make a market in these instruments by holding inventories and by standing ready to buy or sell. Dealers who were prepared to take such a position were provided with an alternative means of financing

inventories of short-term government securities through purchase and resale agreements (PRAs).<sup>14</sup> In June 1954, the chartered banks agreed that they would provide day-to-day loans to dealers within the limits of the PRA arrangements with the Bank of Canada.

The chartered banks used this system as a substitute for direct borrowing from the Bank of Canada. To meet their cash requirements, they typically varied the amount of day-to-day loans they made to the dealers; when necessary, dealers could in turn obtain financing from the Bank of Canada under PRA. Thus, the system permitted the chartered banks to adjust to changes in the supply of cash reserves without disruptive effects on the money market. In retrospect, these developments can be seen as the first steps in a trend toward more flexible credit markets in Canada that continued throughout the 1960s and 1970s.

During this period the Bank of Canada moved away from the use of selective controls, such as moral suasion, in favour of reliance on control of the total supply of money and credit in the economy. This trend, which casts considerable doubt on the validity of the Chant and Acheson thesis discussed above, culminated in the adoption of monetary targets, i.e., the rate of growth of the money supply that would be permitted. These targets were seen as a statement of the Bank's policy strategy in terms of a single variable.

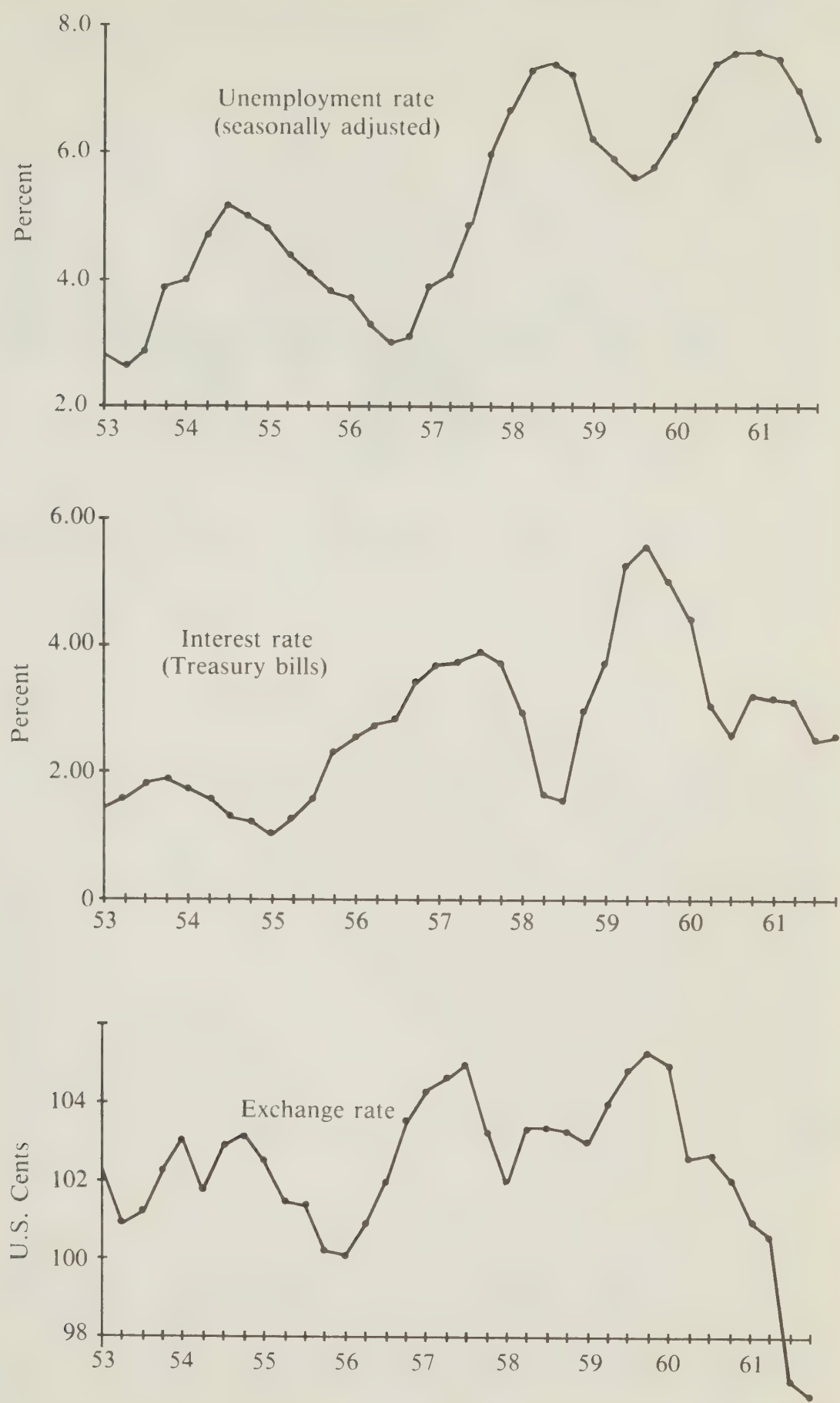
## **BANK ACT REVISION OF 1954**

The change in the method of calculating the cash reserves of the chartered banks enacted in the 1954 Bank Act revision provided further stimulus to the development of the money market, and facilitated the move to active policy. Previously, the cash reserve requirement had been set at a minimum daily ratio of 5 percent of Canadian dollar deposit liabilities. The new system required the banks to maintain minimum monthly average cash reserves of 8 percent of their average Canadian dollar deposits. This specification permitted the chartered banks to run their cash reserves much closer to the required minimum, and increased the importance of the money market as a means of adjusting cash positions.<sup>15</sup>

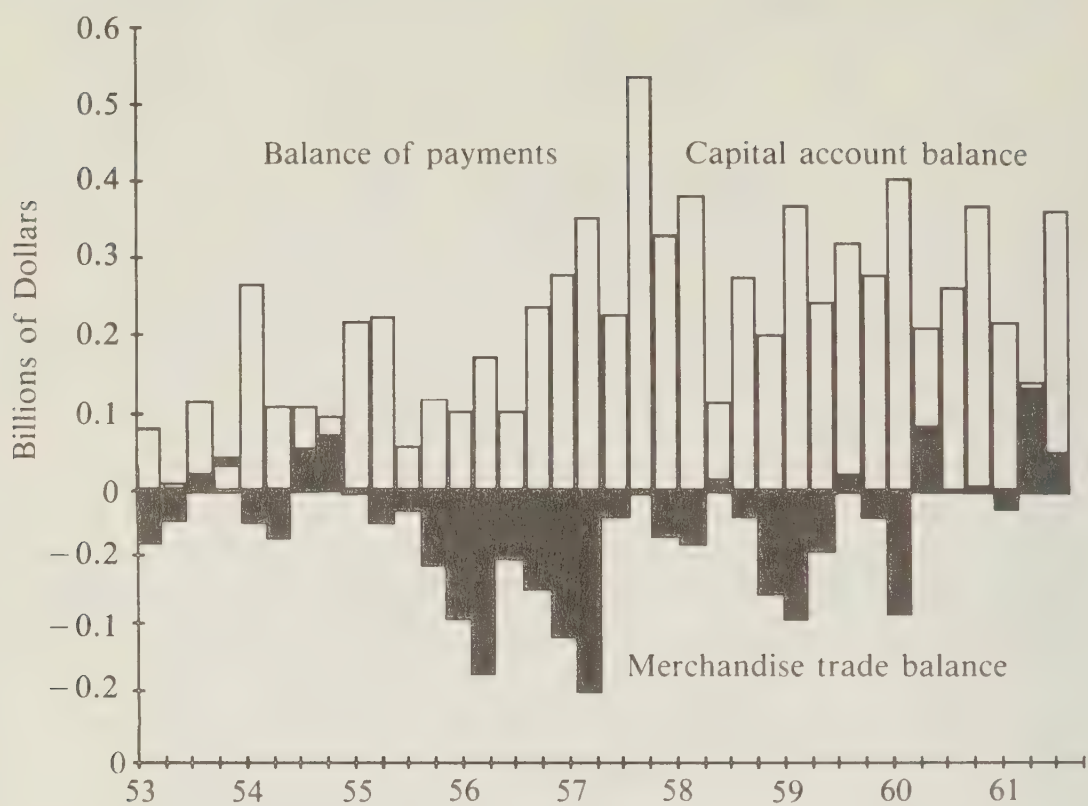
## **The Flexible Exchange Rate Period of the 1950s**

Figure 3-1 shows the performance of the Canadian economy between 1953 and 1961. A sharp but brief recession in 1954 was followed by an investment boom in 1955 and 1956, which resulted in rapid growth in GNP and a decline in the unemployment rate to below four percent. In 1957, the growth rate slowed and the unemployment rate rose sharply. The period from 1957 to 1961 was characterized by slow growth and relatively high unemployment.

**FIGURE 3-1** Canada's Experience with a Flexible Exchange Rate, 1953-61



**FIGURE 3-1 (cont'd)**



Sources: Bank of Canada Statistical Summary (various issues); Statistics Canada, Canadian Statistical Review, Annual Supplement to Section 1, 1974.

### *The Natural Resource Boom of the Mid-1950s*

During the mid-1950s, Canada experienced boom conditions because of world demand for natural resources. Canada's attractive investment opportunities stimulated large capital inflows and pushed up the external value of the Canadian dollar, which remained above 100 U.S. cents and at times rose as high as 105 U.S. cents. This appreciation had the effect of reducing exports and increasing imports, and acted as a stabilizer at a time when the economy was becoming overheated as a result of expansionary disturbances to aggregate demand.

During 1955 and 1956, the Bank of Canada adopted a restrictive monetary policy and interest rates were allowed to increase substantially. Fiscal policy as measured by the cyclically adjusted federal budget balance<sup>16</sup> also had a restraining effect, and inflationary pressures were held in check.

### *The Floating Bank Rate*

During 1955 and 1956, the bank rate was increased as part of the Bank of Canada's restrictive policy. The rate was raised in a succession of seven steps from 1.5 to 3.5 percent. However, in late 1956 the Bank announced that it was switching to a floating rate system under which the bank rate

would be set each week at one-quarter of one percent above the average tender rate on 91-day treasury bills.<sup>17</sup> The main advantage of this system is that it imposes a small penalty cost on a chartered bank that makes use of Bank of Canada advances rather than the money market to replenish its cash reserves.

The floating bank rate has been a subject of considerable controversy in the financial community. The objections are somewhat misguided since they are based to some extent on the notion that the Bank of Canada can control interest rates as a separate objective, while at the same time independently pursuing control of monetary aggregates. This is clearly not possible. A legitimate counter-argument is that the floating bank rate eliminates the need for the Bank of Canada to announce its intentions. However, the “announcement effect” of the bank rate is a clumsy and inefficient means of providing information. At times when conditions in the money market are changing rapidly, fluctuations in the bank rate frequently follow rather than lead market rates. It is important that the public understand that the Bank of Canada can control interest rates only in the sense that it can choose between resisting or not resisting the market forces impinging on the money market and credit markets generally. Such choices are of course governed by the Bank’s overall monetary policy objectives.

### *The Slow Growth Period, 1957–61*

There are a number of parallels between the end of the 1950s and the end of the 1970s, not the least of which is the controversy concerning monetary policy. During 1957, the economy weakened and the unemployment rate rose, reaching a peak of 7.9 percent in mid-1958. In 1958, the money supply was expanded rapidly, but this policy was reversed in 1959 and 1960.<sup>18</sup> During these two years there was almost no growth in the narrowly defined money supply M1 (cash in circulation plus demand deposits). As a result, interest rates rose sharply in 1959 and remained relatively high until mid-1961. Thus, the period from 1959 to 1961 was characterized by a very restrictive monetary policy, in spite of a clear need for economic stimulus.

A review of statements by the Bank of Canada during this period suggests that its restrictive monetary policy was based on two major concerns. First, inflation was seen as a major threat to the Canadian economy, even after 1957 when it was clear that a recession had taken hold. Second, Governor James Coyne placed great emphasis on what he regarded as the unsatisfactory state of Canada’s balance of payments. In his Annual Report for 1959 (pp. 7–8), the governor stated:

For some years, as I see it, the Canadian economy has been under the influence of excessive overall spending, which even in periods of relatively

high unemployment resulted in a net inflow of imports from other countries. . . . The attempt to accomplish too much too fast has given rise to huge deficits in our international balance of payments on current account, . . . to a large and growing volume of foreign debt, . . . and has gone hand-in-hand with a growing degree of foreign predominance in Canadian business.

Continuing this theme in his Annual Report for 1960 (p. 22), Governor Coyne concluded that:

. . . to engage in further large overall monetary expansion in an attempt to drive down interest rates generally, with or without the motive of thereby reducing the inflow of capital from abroad, is an unsound and dangerous approach. . . .

The Bank of Canada's prescription for the supposed ills was to maintain high interest rates — to reduce imports by curtailing overall aggregate demand — and to reduce capital inflows by encouraging domestic saving. This policy was at odds with the theory of an open economy under a flexible exchange rate that was subsequently developed.<sup>19</sup> High interest rates led to excessively high unemployment rates and were a contributing factor to the composition of the balance of payments. Rather than stemming capital inflows, restrictive monetary policy attracts capital and induces borrowers to seek financing outside the country. This, in turn, causes the exchange rate to appreciate, thereby lowering the demand for domestic output and so creating more unemployment.

It is clear that mistakes in monetary policy were a major cause of the stagnation of the Canadian economy in the late 1950s and early 1960s. There was indeed considerable debate about the wisdom of the Bank's policy, and in 1960 a group of academic economists called upon the minister of finance to dismiss the Bank of Canada's governor. Subsequently, there was an acrimonious confrontation between the minister and the governor, and the latter finally resigned in July 1961.<sup>20</sup>

## Monetary Policy in the 1960s

### *Responsibility for Monetary Policy*

In view of the lamentable state of relations between the Bank of Canada and the minister of finance before Governor Coyne's resignation, a major priority for the new governor, Louis Rasminsky, was to clarify the issue of responsibility for monetary policy. In his Annual Report for 1961 (p. 3), the governor suggested two guiding principles:

(1) in the ordinary course of events, the Bank has the responsibility for monetary policy, and (2) if the Government disapproves of the monetary policy being carried out by the Bank it has the right and responsibility to direct the Bank as to the policy which the Bank is to carry out. . . . If this policy, as communicated to the Bank, was one which the Governor felt he

could not in good conscience carry out, his duty would be to resign and to make way for someone who took a different view.

The *Report of the Royal Commission on Banking and Finance* (1964, p. 539) echoed this view when it suggested a “. . . dual system of responsibility under which the Bank formulates monetary policy and executes it from day to day but under which the government must accept full and continuing responsibility for the policy being followed. . . .”

In the 1967 amendments to the Bank Act, a procedure was introduced under which the minister of finance could, in the event of a disagreement with the Bank, issue a directive to the governor on the policy to be followed. Such a directive must be made public and presented to Parliament. This arrangement seems to be a satisfactory compromise on the issue of central bank independence.

## *Monetary Policy Under a Fixed Exchange Rate*

### THE ADOPTION OF A FIXED RATE

The move to a less restrictive monetary policy during 1961 and the government’s announced intention to promote a lower external value of the Canadian dollar created unsettled conditions in the exchange market. In order to stem the speculative outflows, a fixed exchange rate of 92.5 U.S. cents was established in May 1962. In retrospect, it appears that this rate substantially undervalued the Canadian dollar. It subsequently led to considerable intervention in the exchange market; with the exception of 1966, official reserves rose in every year of the fixed rate period. Managing the rate was complicated by attempts by the U.S. government to improve its balance of payments through restrictions on capital outflows and pressure on Canada to limit its accumulation of foreign exchange reserves.<sup>21</sup>

### THE BUILDUP OF INFLATIONARY PRESSURES

The inflation of the 1970s was created in the second half of the 1960s when the United States was experiencing an economic boom — largely because of expenditures related to the Vietnam War. Demand pressure spilled over into Canada, creating a large surplus in the country’s merchandise trade.

As pressure on the Canadian dollar built up, the Bank of Canada was unwilling or unable to neutralize the effects of exchange market intervention on the money supply. In 1967, the rate of growth of M1 was nearly ten percent, compared with an average of about five percent between 1960 and 1964, a clear illustration of the constraints on monetary policy imposed by a fixed exchange rate. Maintenance of the fixed rate pre-

vented the Bank of Canada from resisting the spillover of inflationary pressures from the United States.

## The 1970s: Inflation and the Influence of Monetarism

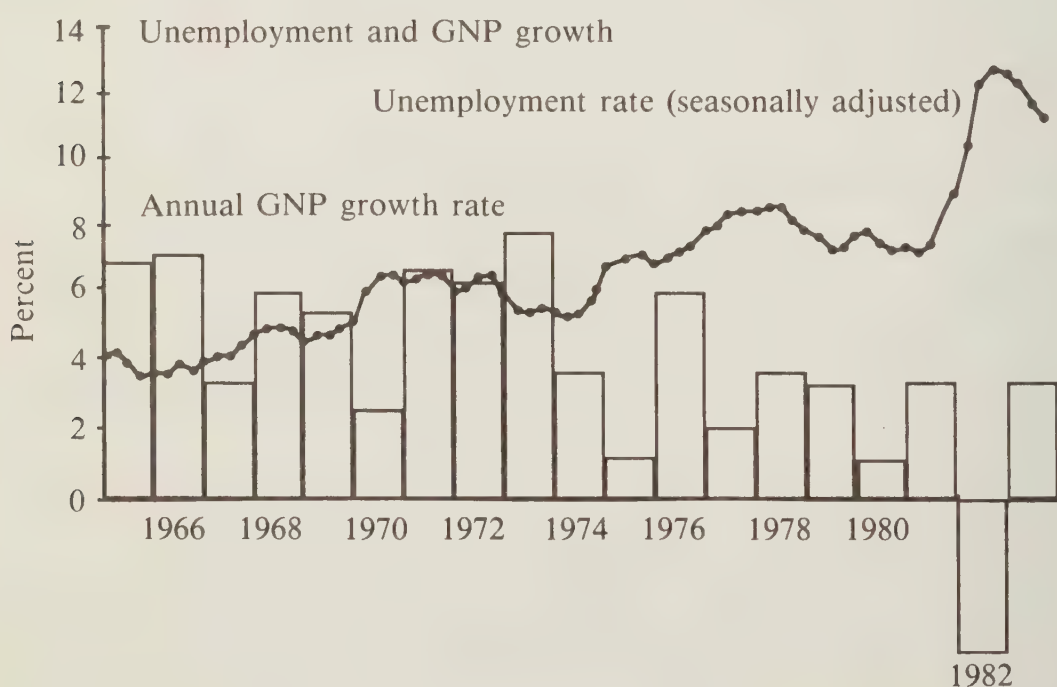
### *Inflationary Pressure and the Freeing of the Canadian Dollar*

The freeing of the Canadian dollar in 1970 provided the Bank of Canada with an opportunity to check inflation. The rate of growth of the money supply was sharply curtailed and the inflation rate eased (see Figure 3-2). Naturally, there was a substantial appreciation of the Canadian dollar. However, shortly after the Bank of Canada had freed itself from the restrictions imposed by a fixed exchange rate and had made progress in bringing inflation under control, it appears to have become reluctant to exploit the benefits of a flexible rate.

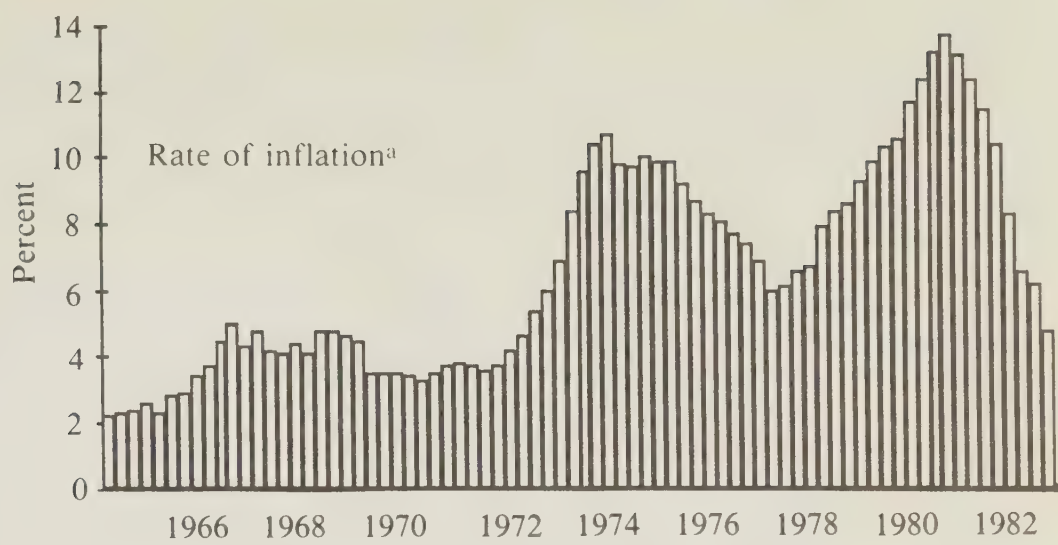
The Bank attempted to resist the appreciation of the Canadian dollar in 1970 and 1971 by intervening heavily in the foreign exchange market. A large appreciation was required to restore the exchange rate to its equilibrium level, and intervention to prevent this from taking place intensified inflationary pressure in Canada.

The second error in policy — the sharp turnaround in monetary policy — occurred in 1971. Subsequent events show that the Bank of Canada overreacted to the slowdown in economic activity and rising unemployment. As can be seen in Figure 3-2, the rate of growth of M1 shot up to a level close to 13 percent in 1971 and rose again to 14 percent in 1972. In 1973 and 1974 there was a sharp increase in the rate of increase in

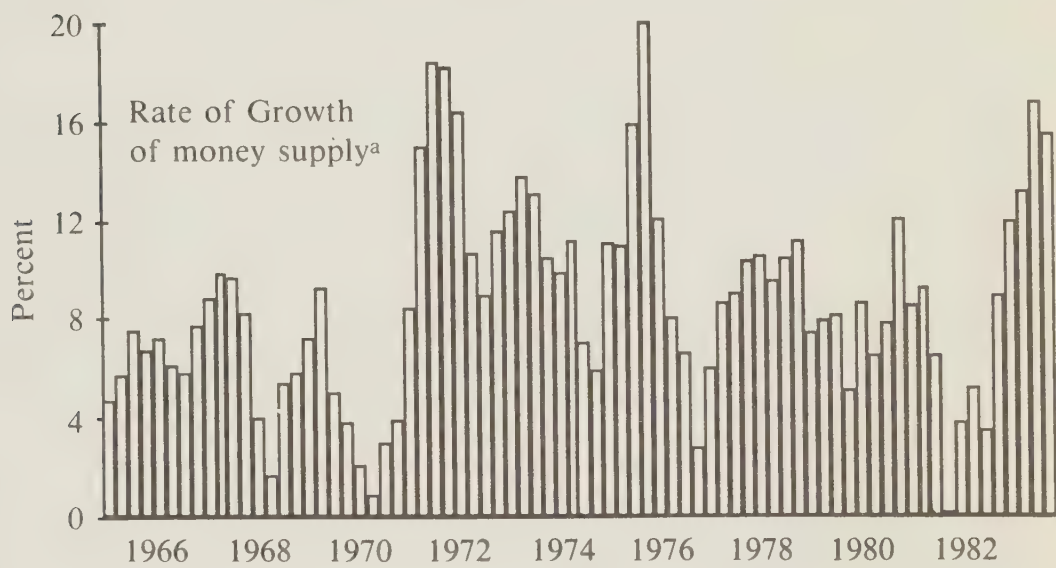
**FIGURE 3-2** The Canadian Economy, 1965-83



**FIGURE 3-2 (cont'd)**



a. Percent change in CPI (excluding food) over same quarter of preceding year.



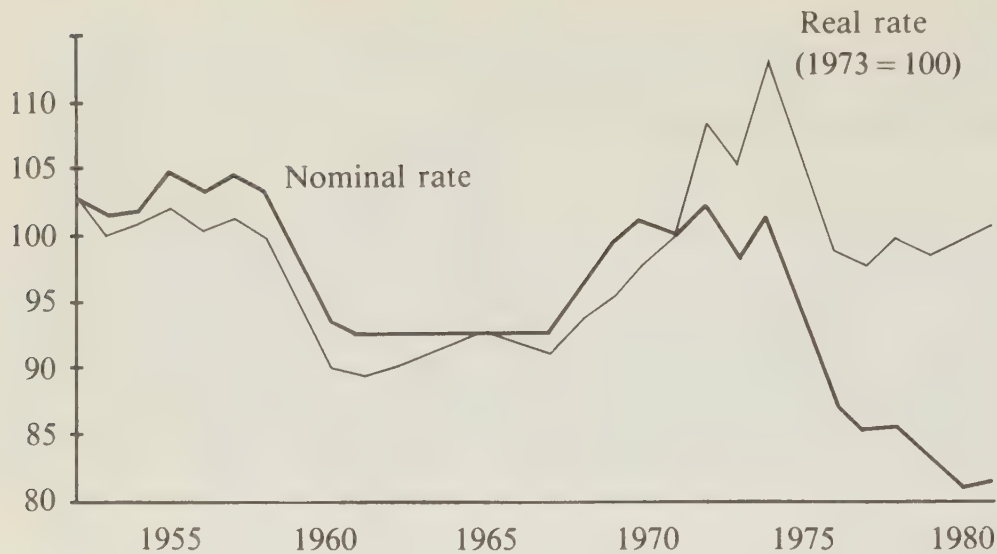
Source: *Bank of Canada Review*, (various issues).

a. Percent change over same quarter of preceding year. 1965-68; M1; 1969-83: M1A.

world commodity prices, led by the OPEC oil price. By 1975 the Consumer Price Index in Canada was rising at a rate of more than 10 percent.

The rate of inflation in the United States was increasing too, but more slowly than in Canada, as can be seen in Figure 3-3 where the actual and real exchange rates are compared. The index of the real exchange rate is obtained by adjusting the actual rate for relative movements in price levels (GNE deflators) in Canada and the United States. The actual rate was held close to 100 U.S. cents between 1972 and 1976, while the difference in inflation rates led to a considerable appreciation of the real rate.

**FIGURE 3-3** Nominal and Real Exchange Rate of the Canadian Dollar against the U.S. Dollar, 1955-83



Sources: Department of Finance, *Economic Review* (1984); U.S. Department of Commerce, *Survey of Current Business* (various issues).

In retrospect, it appears that Canada missed an opportunity to avoid at least part of the increase in the rate of inflation that plagued the world economy in the early 1970s. Monetary policy was immobilized in the late 1960s by a commitment to a fixed exchange rate at a time when inflation rates in other countries were beginning to rise. In the early 1970s, the full benefits of a flexible rate were not realized since the Bank of Canada resisted the appreciation of the Canadian dollar. The Bank appears to have been influenced by an excessive concern for the effect of an appreciation on the competitive position of Canada's export and import-competing industries. It therefore held down the appreciation by direct intervention in 1970 and 1971, and stabilized the rate near 100 U.S. cents in 1972 and 1973 by permitting a rapid rate of growth of the money supply. The short-run effect of an expansionary monetary policy is to hold down the exchange rate, but the long-term consequence is an increase in prices that restores the competitive position of domestic industries to the equilibrium level. In this case, the monetary expansion induced an overshooting of the price level and an appreciation of the real exchange rate, which eventually was reversed by the depreciation that began in 1976.

A second reason for the mismanagement of monetary policy in the early 1970s was that the importance of controlling the rate of growth of the money supply was recognized too late. It was not until 1973, when inflationary forces were already entrenched, that the Bank of Canada began to take steps to keep greater control of the money supply.

## MONETARISM AND THE BANK OF CANADA

Rising inflation in the 1970s led the Bank of Canada to reassess its method of operating monetary policy. It became dissatisfied with the use of interest rates and other measures of the cost and availability of credit as indicators of the stance of monetary policy, and moved toward greater emphasis on control of the money supply. In his Annual Report for 1973 (p. 7), Governor Gerald Bouey commented as follows:

Looking back on the experience of Canada and other countries over a longer period, . . . there have been more substantial and persisting departures from reasonably steady monetary growth than would appear in retrospect to have been desirable. Since the lags associated with monetary policy are rather long, the full effects of such departures do not become apparent until well after the event. . . . In the light of these considerations, I have a certain amount of sympathy with the case that is often made for more stable monetary growth over time. . . . The Bank of Canada certainly has no intention of basing its operations on any mechanistic formula, but . . . it has been giving considerable weight to underlying rates of monetary growth.

Yet despite this rejection of a “mechanistic formula” for monetary growth, two years later the Bank of Canada announced that it would henceforth follow the practice of establishing target ranges for the rate of growth of the narrowly defined money supply (M1). The initial target of 10 to 15 percent a year was established in late 1975.

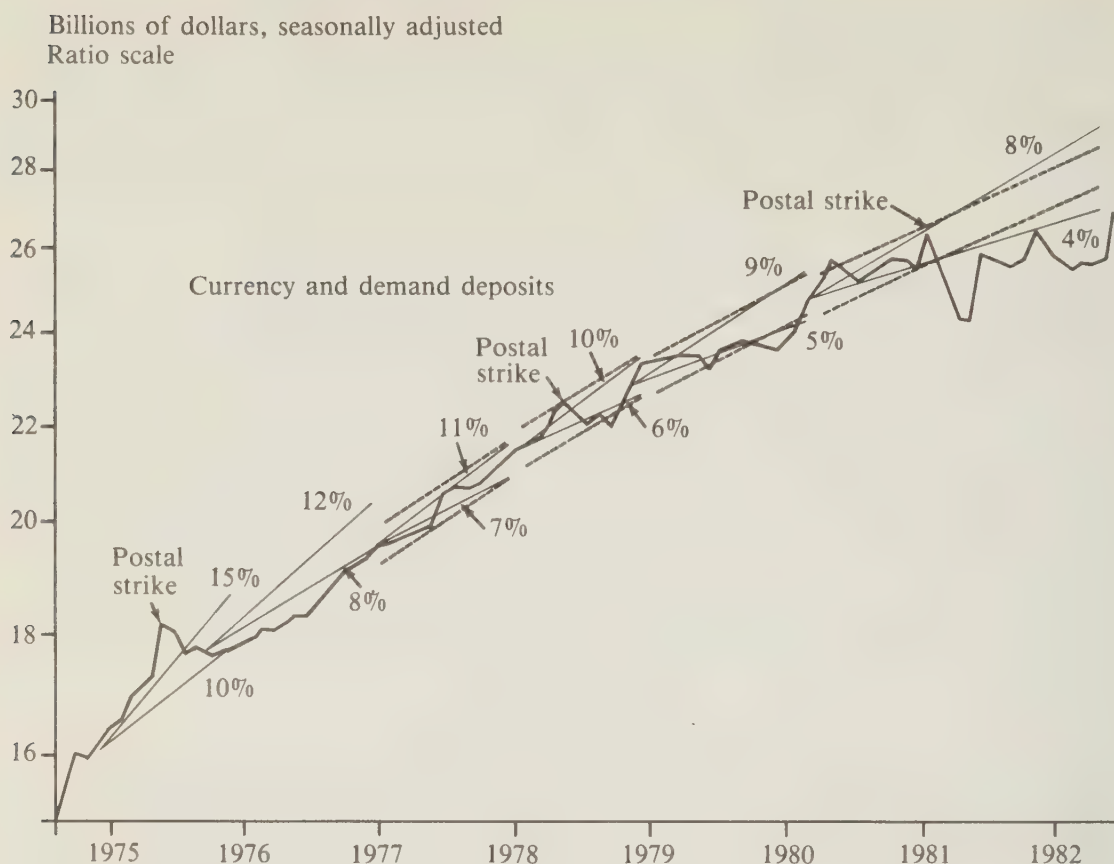
In his Annual Report for 1975 (p. 10), the governor stressed the importance of bringing down the rate of inflation and suggested how this might be accomplished:

One answer sometimes given to this question is that the Bank of Canada should do the job through a sharp and immediate reduction of the growth rate of the money supply to a rate approximately in line with the sustainable real growth of the economy. If that were to happen, it is asserted, inflation would readily come to an end.

The trouble with this prescription is not with the medicine but with the dosage. . . . It would sharply curtail the growth of spending on goods and services in the face of continuing large increases in production costs already built into the economy, and this would almost certainly result in extremely weak markets, widespread bankruptcies and soaring unemployment. . . . The attempt to force as rapid a transition to price and cost stability as this prescription involves would be too disruptive in economic and social terms to be sensible or tolerable.

The Bank of Canada was clearly opting for gradualism. By making its intentions clear, the Bank hoped to influence inflationary expectations directly. Gradualism was subsequently implemented by successive

**FIGURE 3-4 Target Growth Ranges for Money Supply (Currency and Demand Deposits), 1975-82**



Source: Bank of Canada, *Annual Report*, 1982.

reductions in the money supply target to the range of four to eight percent established in February 1981 (see Figure 3-4).

The governor enunciated the philosophy and principles of the Bank's monetary strategy on a number of occasions. In a statement before the House of Commons Standing Committee on Finance, Trade and Economic Affairs in October 1980, he put forward three propositions.<sup>22</sup> The first reaffirmed the overriding importance of bringing down the rate of inflation:

For quite a few years now the nature of the major threat to the future economic welfare of the country has been unusually clear. That threat is inflation. The idea that some inflation is on balance helpful to the performance of an economy . . . is now thoroughly discredited . . . The experience of the world economy . . . [has] shown beyond reasonable question that inflation is malignant.

As to the role of monetary policy in fighting inflation, the governor stated:

. . . in a free society no strategy for dealing with inflation will succeed unless it is well supported by firm and continuing control of the rate of monetary expansion.

In his third proposition, Governor Bouey drew a distinction between real and nominal interest rates:

The basic reason why interest rates are so high is because current and expected rates of inflation are so high. If you make allowance for the current rate of inflation, interest rates are not in fact unusually high. . . . They are not so high as to discourage borrowers who expect continued high rates of inflation.

The Bank of Canada was making a clear commitment to an anti-inflation policy based on monetary gradualism. In doing so, it recognized the consequences for the behaviour of nominal interest rates. In his Annual Report for 1980 (p. 6), the governor stated:

A reduction in the rate of monetary expansion will, other things being unchanged, push up short-term interest rates, and vice versa. In the longer term . . . a reduction in the rate of monetary expansion will over time lead to a lower rate of inflation than would otherwise have existed and interest rates will be lower than they would otherwise have been.

### *Targets and Instruments of Monetary Policy*

The strategy of the Bank of Canada was to use the narrowly defined money supply (M1) as the intermediate target of monetary policy. As the following statement from the Annual Report for 1975 makes clear, the Bank was using short-term interest rates as its policy instrument:

Individual members of the public are, of course, free to decide for themselves how much of their financial assets to hold in the form of currency and demand deposits, but the Bank of Canada can exert a strong influence on these decisions — and thus on the trend of M1 — by virtue of its ability, through its cash reserve management, to influence the level of short-term interest rates. If the rate of growth of M1 is too high the Bank can, by tightening the supply of cash reserves to the banking system, cause short-term interest rates to rise, which will restrain the growth of M1. If, on the other hand, M1 growth is too low, the Bank can loosen its control of cash reserves, thereby causing short-term interest rates to fall and the growth of M1 to be stimulated.

This strategy raises two separate issues. First, what are the merits of interest rates as opposed to other possible variables, such as bank reserves or the exchange rate as the instrument? Second, which monetary aggregate should be chosen as an intermediate target?

### CHOICE OF INSTRUMENT

The choice of an interest rate as the instrument of monetary policy has been vigorously attacked by Courchene (1981, pp. 157–83) who argues that the Bank of Canada can control the money supply with a negligible margin of

error by controlling bank reserves. If this assumption is combined with the fundamental monetarist proposition that there is a stable demand for money, bank reserves will be the appropriate instrument.

On the other hand, it can be argued that the relationship between bank reserves and the money supply, either broadly or narrowly defined, is not likely to be stable in the short run. The bank credit expansion multiplier process does not operate in a simple mechanical fashion in a system with lagged reserve requirements. Since required reserves during the current month are based on average deposits in the preceding month, the supply of reserves in the current month does not constrain the expansion of bank assets and deposits.<sup>23</sup> The Bank of Canada influences the money supply through its setting of the supply of excess cash reserves in relation to the level desired by the chartered banks.<sup>24</sup> When the supply of cash is above the desired level, the banks are induced to buy liquid assets, thereby increasing the volume of deposits. Since the desired level of excess reserves and the speed with which the banks will adjust their liquid assets in response to a gap between the desired and actual levels are variable over time, the way in which the money supply will react to a given supply of cash cannot be predicted precisely.

Thus, in the short run, the money multiplier will be subject to considerable variation. As we indicated above, the consequent short-run financial disturbances provide an argument for the Bank of Canada's practice of using an interest rate as its chosen instrument.

Courchene's proposal is that the Bank of Canada should attempt to control the money supply by simply announcing to the chartered banks that the growth of reserves over a particular period will be set to accommodate a given rate of growth of the money supply, broadly measured in M2 rather than M1. It is not clear how this differs from the adopted strategy except for the choice of monetary aggregate. It may well be that over periods of several months the variance of the money supply will be reduced by a policy of announcing targets that indicate to the chartered banks the extent to which they will have to restrain the expansion of their assets. However, what matters in the choice of instrument is the tightness of the relationship between reserves and the chosen definition of the money supply in the short run, that is, for periods of a month or less.

## THE CHOICE OF MONETARY AGGREGATE

Courchene (1981, pp. 221–29) has further criticized the Bank of Canada's operating procedure with regard to the choice of M1 as the money supply target. In the Annual Report for 1975 (p. 15), the governor states that the choice is "a matter of selecting the one whose behaviour over time appears to be most systematically related to the trend of national expenditure and to short-term interest rate movements." As argued by Courchene,

it appears that the Bank is confusing the issue of controllability of the monetary aggregate with the ultimate purpose of using an intermediate target to formulate policy. The Bank uses a money demand function to determine the appropriate setting of its interest rate instrument, and therefore chose an aggregate whose demand is most closely related to the interest rate.

In our view, Courchene's criticism is valid since it is clear that the relevant criterion for choice is the ability of the aggregate to explain movements in income. However, empirical determination of the optimal choice on this basis is hampered by a number of econometric difficulties. Pending a clear resolution of this problem, it may be better to focus on the money demand function even though it is only one element in the system of relationships connecting income with the money supply.<sup>25</sup>

### *Monetary Policy and the Exchange Rate*

Beginning in late 1979, the Bank of Canada, faced with a sharp increase in volatility in U.S. interest rates, had to choose between allowing Canadian rates to move with U.S. rates or allowing the exchange rate to move to accommodate a differential in rates between the two countries.<sup>26</sup> Commenting on the Bank of Canada's options in the face of a rapid increase in short-term rates, Governor Bouey stated that the Bank's strategy was to adopt a middle ground. He defended a policy of resisting exchange rate depreciation:<sup>27</sup>

The reason why there is a very real limit to how far the Bank of Canada can prudently go in present circumstances in insulating the Canadian interest rate structure from steeply rising interest rates abroad and accepting the exchange rate consequences of such a policy is the danger of making our already severe inflation problem considerably worse. . . . We could expect the domestic prices we have to pay for our imports and for the export-related commodities we consume here in Canada to rise. . . . In Canada's current environment of highly charged fears and expectations of worsening inflation, a substantial jump in prices that raised our present double-digit inflation rate even higher would be likely to trigger a further escalation of wage increases.

In order to analyze this issue, using the framework outlined in the first section, it is necessary to distinguish between *temporary* and *permanent* changes in foreign interest rates. In the latter case we must also distinguish between changes in real and nominal rates.<sup>28</sup>

### A TEMPORARY CHANGE IN FOREIGN RATES

Consider first the appropriate response to a sudden sharp increase in U.S. rates such as occurred in early 1980 when the 90-day paper rate rose from just under 14 percent to nearly 18 percent. Such an increase is

likely to be viewed as a temporary one that will be reversed in the near future. Under these circumstances, there would be no reason for expectations of the future exchange rate to change. The interest parity condition would imply that:

$$\begin{aligned} &\text{change in domestic interest rates} + \text{depreciation of currency} \\ &= \text{change in foreign interest rate}^{29} \end{aligned}$$

If the Bank of Canada responds to the increase by preventing any rise in Canadian interest rates, the interest parity condition is maintained by a depreciation that is expected to be reversed in the future. In other words, the interest differential in favour of investment in the United States is offset by an expected future appreciation of the Canadian dollar that will occur as U.S. interest rates return to normal levels. However, the depreciation leads to an increase in the domestic price level because of the direct effect on the price of internationally traded goods and the indirect effects operating through the prices of nontraded goods and wages.

At the opposite extreme, the Bank of Canada could avoid any depreciation and consequent price increases by allowing an increase in Canadian interest rates to match the increase in U.S. rates. To accomplish this, the Bank would have to abandon its targets and slow down the rate of growth of the money supply. Such a tightening of monetary policy would put downward pressure on prices of nontraded goods, but only at the cost of reduced output and employment.

Thus it can be argued that the Bank of Canada's middle ground strategy is the appropriate one in the case of temporary increases in U.S. rates. By allowing some increase in domestic interest rates, the inflationary effects of a depreciation of the Canadian dollar are reduced directly by limiting the extent of the depreciation and indirectly by restraining domestic demand. Nevertheless, this strategy involves a departure from the growth rate of the central bank's target money supply for the purpose of offsetting a *temporary* increase in the price level. It is based on the proposition that this temporary increase will be falsely perceived as a permanent increase in the inflation rate that will exacerbate the wage-price spiral.

## A PERMANENT CHANGE IN NOMINAL FOREIGN RATES

When we consider longer term increases in U.S. interest rates that are expected to persist, the implications of the interest parity condition are quite different. Suppose that there is an increase in nominal U.S. interest rates related to an increase in the expected rate of inflation in the United States. In this case, it can be argued that the interest parity condition will be maintained simply by an increase in the expected rate of appreciation (or reduction in the expected rate of depreciation) of the Canadian dollar. Higher inflation in the United States will be expected to lead to an appreciation of the Canadian dollar so as to maintain equality in the price

of traded goods in the two countries; there will be no need to raise interest rates in Canada to prevent a depreciation of the Canadian dollar.

Between 1978 and 1980 there was no evident trend in the U.S.–Canada interest rate differential, presumably because inflationary expectations were rising in both countries. However, the mechanism discussed above appears to have operated in the reverse direction in 1981 as a result of a decline in the U.S. rate of inflation that was not matched in Canada. The expectation of continuing higher inflation in Canada compared with the United States forced the Bank of Canada to allow the gap between Canadian and U.S. rates to widen. In the second half of 1981, the 90-day paper rate in Canada averaged about three and one-quarter percentage points above the comparable U.S. rate, compared with the period 1978 to 1980 when the spread averaged less than one percentage point.

## A PERMANENT CHANGE IN REAL FOREIGN RATES

Now suppose that the change in the foreign interest rate represents an increase in the real rate of interest with no change in expected inflation. Consider first the implications of the interest parity condition for the long-term adjustment of the Canadian economy. In the absence of real disturbances, the relative price of traded and nontraded goods must remain constant, so that the rate of depreciation of the domestic currency will be determined by:

$$\begin{aligned}\text{rate of depreciation} &= \text{domestic inflation rate} \\ &\quad - \text{foreign inflation rate}\end{aligned}$$

Combining this with the interest parity condition implies:

$$\begin{aligned}\text{domestic interest rate} &- \text{domestic rate of inflation} \\ &= \text{foreign interest rate} - \text{foreign rate of inflation}\end{aligned}$$

In other words, in the long run, interest parity implies equality of the domestic and foreign real interest rates. Just as there is no long-run trade-off between inflation and unemployment, *there is no long-run trade-off between the domestic interest rate and the exchange rate*. Ultimately, the central bank must respond to an increase in the foreign real rate by allowing an equal increase in the domestic interest rate.

There will still be a short-run trade-off to the extent that there is a lag in the adjustment of expectations. The appropriate strategy will again be to allow an increase in the domestic interest rate that is smaller than the increase in the foreign rate. However, the domestic nominal interest rate could be held down permanently only by reducing the domestic rate of inflation. This would require a reduction in the rate of growth of the money supply and a temporary increase in interest rates.

## The 1980s: Reappraisal of Monetarism

The performance of the Canadian economy since the adoption of a monetarist strategy by the Bank of Canada has led to adverse criticism

from outside the Bank as well as a reappraisal within. The issues can be summarized as follows:

## SUPPLY SHOCKS AND INFLATION

One can accept the monetarist view that control of the money supply is an essential part of any anti-inflationary policy, while recognizing that other factors influence short-run movements in the price level. In particular, the sharp increases in world prices of oil and other commodities that occurred in 1973–74 and 1978–79 could not be absorbed without an increase in the price level or a rise in unemployment or, as was experienced, a combination of the two. Tighter monetary policy could have brought about a slower rate of increase of the domestic price level, in the face of rising prices for natural resources, only by inducing even higher unemployment in the non-resource sectors.

## WAS MONETARY GRADUALISM TOO GRADUAL?

The argument that the implementation of monetary gradualism was too gradual has been made by the Bank of Canada on a number of occasions. For example, in a statement before the House of Commons Standing Committee on Finance, Trade and Economic Affairs in 1980, Governor Bouey said:<sup>30</sup>

The experience of the past few years appears to have led some observers to conclude that the Bank's approach to reducing inflation has failed. If they mean that progress in reducing inflation is less than the Bank hoped, I agree with them. But if they mean . . . that the Bank's approach was misconceived, then they have misread the history of the period. What they should conclude is that . . . it would have been better if the slowing of monetary growth had been less gradual so that it would have had more impact on inflation.

Whatever the merits of this view, the Bank of Canada abandoned gradualism in 1981 and held the growth of M1 below the previously announced target range (see Figure 3-4). This change of policy seems to have been dictated mainly by the severe tightening of monetary policy in the United States. Courchene (1983, p. 7) concludes that:

. . . Canada was finding itself off-side vis-à-vis the Americans in the fight against inflation. Accordingly . . . the discipline imposed on the Americans had to be transferred to Canada, and the obvious way of doing so was to import the U.S. wage and price discipline by tying ourselves to the U.S. dollar.

## ARE MONETARY AGGREGATES RELIABLE GUIDES FOR POLICY?

The Bank of Canada's Annual Reports for 1981 and 1982 contain detailed discussions of the Bank's experience with monetary aggregates. It is argued

that the usefulness of M1 has been impaired by innovations in banking practice, such as daily interest savings accounts and expanded cash management services for businesses. Initially the Bank attempted to adjust to take account of these changes, but in November 1982 it announced that it was abandoning the practice of establishing M1 targets.

Since then, the Bank has been exploring the possibility of using a somewhat broader measure of transactions balances. While it is not likely that any single aggregate can be identified that will serve well into the indefinite future, it is important that the clear advantages of the Bank's targetting strategy be retained. The main advantage is that the conduct of monetary policy has moved away from a preoccupation with responses to short-run cyclical developments and has focussed more on longer-term objectives. Second, the use of monetary targets has provided a clear quantitative measure of the Bank's policy so that the results can be subjected to evaluation both within the Bank and by outside critics. Third, to the extent that monetary aggregates reflect current movements in nominal income, their use helps to reduce cumulative errors in monetary policy that can result from delays in the collection of data on current economic conditions.

## **Conclusion**

Our review of monetary policy in Canada suggests two major strands of development in the postwar period. The first concerns the procedures used by the Bank of Canada in implementing policy and the second involves the role of the exchange rate in formulating policy.

### ***The Operation of Monetary Policy***

Over the period, there has been a substantial move away from the use of selective controls in favour of reliance on control of the total supply of money and credit. This process began with abandonment of the wartime policy of pegged interest rates and the development of an active money market in Canada in the early 1950s. The development of more flexible credit markets continued through the 1960s and 1970s and enhanced the Bank's ability to pursue monetary control through open market operations.

In my view, these developments improved the functioning of monetary policy. The primary role of the central bank has been and should continue to be to control the overall supply of money and credit in the economy. Special financing problems experienced in particular sectors or regions should be addressed through specific programs such as those designed to assist small businesses.

A new procedure for implementing monetary policy was introduced in 1975 when the Bank of Canada began establishing target ranges for the rate of growth of the money supply. This practice was abandoned in 1982 because the Bank felt that it could no longer interpret movements of

monetary aggregates in a period when the cash management services of the chartered banks were changing.

I regard the implementation of monetary policy through money supply targets to have been a useful strategy. Although it is unrealistic to expect that any particular measure of the money supply can be relied on for a long period, it is to be hoped that the Bank of Canada will continue its efforts to develop a usable alternative to the M1 aggregate that it was forced to abandon. The advantages of monetary targetting include the focus on longer-term objectives, the provision of a clear quantitative measure of the Bank's policy, and the avoidance of cumulative errors in policy.

### *The Role of the Exchange Rate*

Under both fixed and flexible exchange rate regimes, the external value of the Canadian dollar has been an important consideration in monetary policy decisions. A mistaken view of the effects of monetary policy in an open economy was a factor in the excessively restrictive policy that contributed to the stagnation of the Canadian economy in the late fifties and early sixties. Some observers may argue that the restrictive policy followed in the late seventies and early eighties was also misguided, but it is clear that inflation has been a much more serious problem recently as compared with the earlier period.

The constraints on monetary policy under a fixed exchange rate regime were well illustrated by the experience in the second half of the 1960s when demand pressure in the U.S. spilled over into Canada. With the exchange rate pegged, it was inevitable that foreign price increases would be transmitted to the domestic price level.

Under flexible exchange rates, it may be possible to insulate the domestic price level from changes in foreign prices. If the currency is allowed to appreciate when there is an increase in foreign prices, the domestic price of traded goods can be maintained. However, after the return to a flexible rate in 1970, the benefits were initially not realized since the Bank of Canada attempted to hold down an appreciation by direct intervention and by permitting rapid growth of the money supply.

After the adoption of money supply targetting by the Bank of Canada in 1975, exchange rate movements initially did not appear to have had a substantial influence on policy. This situation ended in late 1979 in response to the increased volatility of U.S. interest rates. The Bank of Canada adopted a middle-ground strategy of allowing smaller fluctuations in Canadian rates combined with movements in the exchange rate. In this way it attempted to moderate the effects of exchange rate changes on domestic prices while at the same time avoiding the destabilizing effects of interest rate fluctuations on aggregate demand. It should be recognized, however, that there is no permanent trade-off between the

domestic interest rate and the exchange rate. In the long run, the domestic real rate of interest must equal the foreign real rate, and the central bank can influence only the nominal rate by influencing the rate of inflation.

The exchange rate became a dominant consideration in 1981 when the Bank of Canada abandoned its attempts to bring down the inflation rate through gradual reduction in the rate of growth of the money supply. This appears to have been precipitated by the severe tightening of monetary policy that had occurred in the United States. In my view, the Bank put far too much weight on the inflationary consequences of a depreciation when high unemployment rates in Canada were persisting in spite of the substantial recovery experienced in the U.S.

## Notes

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1. There are, of course, intermediate cases of goods, such as newsprint, for which Canadian exports account for a significant fraction of the world market. Therefore, Canadian producers do have an impact on the world price.
2. Alternatively, output could be disaggregated into export goods, whose prices are determined in the domestic market, and import goods, whose prices are determined in other countries. This approach seems less appropriate to a country specializing in natural resources and does not allow for the direct effect on the domestic price level of a change in world commodity prices.
3. This condition may not hold exactly when exchange rate risk is taken into account. It is applicable primarily to short-term capital flows.
4. For a discussion of the theory and observed behaviour of interest rates and exchange rates, see Mussa (1979).
5. For a detailed discussion of money and the determination of the inflation rate in an open economy, see Laidler (1985).
6. The late Harry Johnson was also a vigorous opponent of an independent monetary authority. See, for example, Johnson (1964).
7. Only a brief overview of this issue is provided here. For a detailed discussion, see Dufour and Racette (1985).
8. This proposition follows from the interest parity condition and is discussed in detail below.
9. A detailed description of the factors influencing monetary policy during this period is given by G.S. Watts (1973, 1974, 1976) as part of a series of articles which chronicle Bank of Canada operations from 1935 to 1954.
10. The government's intention to implement actively the Keynesian theory of counter-cyclical fiscal policy was announced in the white paper on Employment and Income in April 1945.
11. In 1951, the chartered banks agreed to limit credit in the form of corporate securities and term loans, to tighten lending practices on commercial and personal loans, and to impose various margin requirements.
12. Pegged bond prices were abandoned in Canada before the Treasury-Federal Reserve "Accord" of March 1951, which provided for the resumption of active monetary policy in the United States.
13. For a detailed description, see Watts (1976, pp. 4–10).

14. Under these arrangements, the Bank of Canada provides funds to dealers by purchasing securities from them, with an agreement that the dealers repurchase them.
15. The Bank of Canada was also given the power to vary the cash reserve ratio between 8 and 12 percent, but it never made use of this policy instrument during the period in which this provision remained in effect.
16. This series is calculated by the Department of Finance and is published every April in the annual *Economic Review*.
17. See Bank of Canada, *Annual Report*, 1959, pp. 45–46. For a discussion of the return to the floating rate system in 1980, see Bank of Canada, *Annual Report*, 1980, pp. 9, 34.
18. The expansion during 1958 was clearly prompted by debt management considerations rather than economic stabilization. It was necessary to facilitate the Conversion Loan under which the federal government offered to exchange newly issued bonds with attractive terms of outstanding "Victory Bonds." See Gordon (1961b), p. 13.
19. The experience of this period was in fact a stimulus to the development of this theory. One of the earliest statements is given in Mundell (1961).
20. See Gordon (1961b).
21. This constraint was less binding than it might appear since Canada had acquired substantial loans from the IMF during the exchange crisis of 1962. U.S. dollars purchased by the Exchange Fund and used to repay this debt did not show up in official figures.
22. Reprinted in the *Bank of Canada Review*, Nov., 1980, pp. 13–19. The earliest statement was given in an address to the Canadian Chamber of Commerce in Saskatoon in September 1975. Thomas Courchene dubbed this speech the "Saskatoon monetary manifesto." See Courchene (1976).
23. For a detailed discussion of money supply determination in Canada, see Dingle et al. (1972).
24. Central bank control over the money supply was tightened by the provision in the 1967 Bank Act that the chartered banks must meet the minimum average reserve requirement within each half of the month. For precise details, see *Bank of Canada Review*, notes to the tables.
25. For a discussion of the problems of empirical determination of the optimal choice of aggregate, see White (1978).
26. The increased volatility of U.S. rates appears to have been related to the adoption by the Federal Reserve of new operating procedures that put more emphasis on control of bank reserves rather than interest rates. See Board of Governors of the Federal Reserve System, *Federal Reserve Bulletin*, Oct. 1979, p. 830. For a historical review of operating procedures in the United States, see *Federal Reserve Bulletin*, Sept. 1979, pp. 679–91.
27. Statement at a meeting of the Federal and Provincial Ministers of Finance, Dec. 1980; reprinted in *Bank of Canada Review*, Jan. 1981.
28. The analysis in this section is taken from Sparks (1982).
29. The interest parity condition is  $i = r + e^* - e$ , where  $i$  and  $r$  are the domestic and foreign interest rates, and  $e$  and  $e^*$  are the current and expected future exchange rates (domestic currency value of foreign exchange). If  $\Delta e^* = 0$ , then  $\Delta i + \Delta e = \Delta r$ .
30. See *Bank of Canada Review*, Nov. 1980, p. 7.

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## Regional Stabilization in Canada

YVES RABEAU

### Stabilization and the Regions: A Survey

During the period of Keynesian orthodoxy in the 1950s, an interest emerged in Canada in the regional dimension of stabilization policy. In 1956, Harvey investigated the impact of national measures designed to regulate aggregate demand in the context of the regional disparities that have always characterized the Canadian economy.

Though there was no statistical information on production available, the unemployment figures pointed to systematic divergences in these indicators across Canada (Harvey, 1956). In addition, while historical unemployment rate profiles for the various regions of Canada were quite similar, the magnitude of the variations in regional utilization rates was not the same. Regions that on average had a higher unemployment rate than the national average were generally affected more severely by recessions. In periods of recovery, regions that had experienced a milder recession were quicker to return to full employment, whereas in other regions the unemployment rate could have been reduced even further.

This type of regional economic behaviour obviously raised the problem of matching macroeconomic stabilization policies to the cyclical needs of the regions:

At the peak of a boom, a national scale anti-inflation policy will tend to have a beneficial effect in regions with a utilization rate higher than the national average, but it will probably be inadequate. The same policy will generally not have a positive impact on economies with a utilization rate lower than the national average, since it will tend to dampen economic activity either before (and sometimes well before) the regions have achieved full employ-

ment, or precisely when they are more or less at full employment and would consequently need a neutral policy.

Conversely, in periods of economic slowdown an expansionary policy will be beneficial for all regions, but it will be too strong for regions with a utilization rate higher than the national average and too weak for the others. In any case, the federal government's fiscal policy is never appropriate for the regions. (Rabeau, 1971)

This diagnosis gave rise to the proposal that the federal government should regionalize its stabilization policy, if only partly.

Meanwhile, the sharp expansion of provincial government budgets during the 1960s, at a time when Ottawa had begun transferring money to them, raised other questions. The Keynesian effectiveness of the federal government's stabilization policies might be threatened by procyclical behaviour on the part of provincial budgets. Furthermore, the provincial governments, now equipped with a broad range of economic policy instruments, might be tempted to address their need for cyclical stabilization by implementing their own policies, which could, on occasion, neutralize or hamper the stabilization efforts of the federal government.

But by the end of the 1960s, the orthodox Keynesian position on the federal government's responsibility for stabilization no longer enjoyed unanimous support in Canada. Decentralization of federal government powers could also be applied to the case of stabilization, especially in view of the regional disparities reflected in the Canadian business cycle:

Complete federal responsibility might be justified if unemployment . . . across Canada moved together, if full employment in one area was matched by full employment in all other areas and if federal action has an equal impact in all areas. (Nowlan, 1973, p. 154)<sup>1</sup>

Because of the considerable size of some of the provincial economies, Barber (1967) proposed that the provincial governments engage actively in economic stabilization. He further recognized that there was much to be gained from coordinating federal and provincial government strategy. However, the *extent* to which each government should intervene is a problem to which no clear or simple solution has been found. Added to this was the fact that the provincial and federal governments might differ over stabilization goals, as well as their choice of target utilization rates and the orientation that stabilization policy should be given at any particular time. Conflicts between stabilization objectives are likely to emerge particularly because, in an open economy, the federal government is responsible for maintaining an acceptable trade-off between inflation and unemployment, while the provinces are concerned primarily with resource utilization levels.

Following this assessment of regional stabilization needs and the recognition that the provinces did have the capacity to intervene in this area, work in the 1970s concentrated on both the rationale for and possible institutional forms of regional stabilization.

Early studies conceded that, from the point of view of resource allocation, it would not necessarily be desirable for a regionally oriented stabilization policy to be aimed at equalizing or even appreciably reducing regional differences in unemployment rates. If economic policy could reduce unemployment disparities across the country, it should likewise enhance manpower mobility and the effectiveness of the price mechanism on the labour market while also helping to raise productivity in lower-income regions.

If the regions exhibited vastly different cycles, the goal of regional stabilization could be to reduce the fluctuations in aggregates, without having any effect on average unemployment rate differentials. Federal government intervention in this case would assume no transfers of resources between regions. But one objective of regional stabilization that has been discussed by a number of authors over the past decade would be to prevent some regions from having excessively high unemployment during recession periods without braking their expansion too soon, even if this meant holding back demand in regions with low unemployment rates where the economy could become overheated. This kind of policy would make it possible both to maintain aggregates at stable levels and to reduce differences in average unemployment rates between regions.

This entire approach raises at least two serious problems. First, is it really possible to act on the average unemployment rate of a high-unemployment region within a cycle so as to reduce the difference between the regional rate and the national average? The answer depends upon the causes of the unemployment. If part of the differential can be attributed to regional demand deficiency over a full cycle, a policy of demand stimulation — assuming it is effective in the Keynesian sense — could in fact reduce disparities in unemployment rates. If the differences are essentially the result of inefficient labour markets and other structural problems, a policy of raising demand could create inflationary pressures that might widen the unemployment rate gap in the future. The second problem concerns resource transfers between regions. Several policies adopted by the federal government since the war have served either directly (e.g., equalization payments) or indirectly (e.g., unemployment insurance) to redistribute resources among the regions. Is it then really desirable to add stabilization policy to the list of instruments that transfer resources between regions?

Since the mid-1970s, several answers to those two questions have been put forward. A number of studies have shown that regulation of regional demand could probably reduce the average unemployment rate in regions with lower levels of resource utilization. Different ways to implement a regionalization of stabilization policy have been suggested. It is generally recognized that the federal government should coordinate this policy as well as some resource transfers between regions. But it is also

acknowledged that, in practice, federal-provincial cooperation for regional stabilization would lead to a number of difficulties.

Indeed, the difficulties could be so serious that it may be preferable to maintain the status quo rather than create new institutional arrangements in the area of federal-provincial relations. New quarrels between Ottawa and the provinces would only nullify any benefits that might be expected from applying stabilization at the regional level.

On the other hand, recent studies of the Canadian labour market imply that a policy of regulating demand at the regional level would have a limited effect on unemployment rate disparities. Moreover, intervention in the labour market by some provincial governments has had a tendency to make the market less efficient at the regional level, thereby diminishing the benefits that might be expected from a regional stabilization policy. In a more general view, some analysts maintain that the mechanisms for redistributing wealth among the regions of Canada that have been developed in the last few decades by the federal government have tended to *reduce* the efficiency of the resource allocation process and generate perverse effects, especially on the mobility of workers. Since a regional stabilization policy would entail further transfers of resources between regions, it might accentuate this inefficiency.

Finally, the debate over the appropriateness of adopting stabilization measures also applies to the regional question. If crowding-out effects or the expectations of economic agents cancel the medium-term multiplier effect of a policy designed to increase regional demand, then no lasting effect on regional unemployment rate disparities can be expected from stabilization policy. In that case, a reduction of the numerous provincial and federal government interventions in the economy would be much more favourable for the functioning of the labour market than any deliberate attempt at stabilization.

## **Rationale for Regional Stabilization Policies**

Differences in regional resource utilization rates have stimulated analysis of the question of a regionalized stabilization policy. This section begins with a short summary of findings on regional unemployment rate differences in Canada and their cyclical behaviour.<sup>2</sup> It then examines the causes of the disparities and differences in cyclical behaviour. The appropriateness of regional stabilization policy can be determined only in conjunction with an examination of these causes.

### ***Statistical Background***

#### **UNEMPLOYMENT RATE DISPARITIES**

Ever since data on unemployment have been collected in Canada (the first survey was the 1921 census), disparities in unemployment rates have

TABLE 4-1 Regional Unemployment Rate Disparities Compared to Canadian Averages

Year	Atlantic	Quebec	Ontario	Prairies	British Columbia
1966	2.0	0.7	(0.8)	(1.0)	1.2
1973	2.3	1.3	(1.2)	(0.8)	1.2
1981	4.1	2.8	(0.6)	(3.1)	(0.9)

Source: Statistics Canada.

Note: Figures in parentheses indicate a negative disparity.

been observed between the regions of Canada. Since the 1950s, the classification of regions on the basis of the difference between their unemployment rates and the national average has remained more or less stable. Table 4-1 shows divergences in unemployment rates from the national average for years that correspond to expansion peaks. For regions whose rates lie *above* the average, expansion peaks correspond to the point when divergences over the whole cycle are smallest.

First of all it can be seen that the divergence from the average for Quebec and the Maritimes has grown since the 1960s. In the case of the Western provinces, the positive difference noted as early as 1966 increased at the end of the 1970s with the development of the oil industry. In general, British Columbia had an unemployment rate above the national average, but that situation changed in 1981, when the unemployment rate for this province fell below the national average. On the whole, it can be concluded that disparities in resource utilization rates have grown in Canada since the 1960s, even though a number of efforts have been made to reduce regional disparities.

## CYCLICAL BEHAVIOUR OF THE REGIONS

The movement of unemployment rates shows that as a rule the regional cycles do not move in opposite directions. However, there are appreciable differences in the size of the cyclical variations in unemployment rates and in the speeds at which the rates change. Although regional business cycles do not move in opposite directions, at certain times significant cyclical differences can exist between the regions. In the summary of an exhaustive study of unemployment rate movements in Canada, Beaudry (1976a) concluded that there do exist, on the one hand, sizable disparities in the *intensity* with which unemployment reacts to the aggregate demand cycle in the various regions, and on the other hand, just as sizable differences in the *time lags* required by unemployment in the regions to react to the cycle of aggregate demand.

Because of these differences in cyclical behaviour, the divergence from the average in regions that have an unemployment rate above the

national mean grows quite appreciably during recessions. These regions are invariably harder hit by a recession:

Past experience shows that an increase of 2 percentage points in the Canadian unemployment rate is typically accompanied by an increase of roughly 3.7 points in the Atlantic region, 2.6 points in Quebec, 1.3 points in Ontario, 1.7 points in the Prairie region and 1.9 points in British Columbia. (Economic Council of Canada, 1977, p. 49)

Furthermore, since the disparities in regional unemployment rates usually lessen at the peak of an expansion, there is a stronger recovery in regions with high unemployment. In general then, the unemployment cycle is characterized by broader fluctuations in these regions.

### *Causes of Unemployment Rate Disparities*

In an economy with a very mobile work force, where the labour-market price mechanism functioned efficiently, differences in unemployment rates between regions would not be large or last long.<sup>3</sup>

While labour mobility in itself is perhaps unable to eliminate disparities in the rate of resource utilization, such disparities might still be ascribed to differences in comparative advantages between regions (Swan, 1977). Accordingly, if the nature of economic activity differed from region to region, unemployment levels could mean quite different things in different regions. One region might be more affected than another by seasonal factors, which would be reflected in average employment rates over the cycle. Short- as well as long-term variations in demand on international markets might be particularly important for one region and less crucial for one that depended more on the domestic market. But it is also necessary to take regional differences in efficiency of resource allocation into account. A lack of wage flexibility could raise a region's unemployment rate. This section examines the factors that may help to sustain disparities in regional unemployment rates.

### MOBILITY

Before the 1970s, interregional labour mobility in Canada, except in Quebec, was quite high compared to other Western countries (Grant and Vanderkamp, 1976). In the 1970s, however, interregional migration *declined*. The revision of the unemployment insurance program is perhaps partly responsible for this net decrease of interregional mobility in Canada (Green and Cousineau, 1976; Courchene, 1978). For one thing, the increase in unemployment insurance benefits reduced the advantages of mobility in lower-wage regions, along with workers' propensity to seek a new job. Also, more generous benefits in the low-income regions served to accentuate "return migration" by workers to their

region of origin, a trend that had first been noted at the end of the 1960s (Vanderkamp, 1971).

The high mobility of the 1960s was thus not sufficient to reduce disparities in unemployment rates, but did nevertheless help prevent them from growing. In Quebec, where mobility had little effect, an increase in the divergence of unemployment rates from the national average was noted at the end of the 1960s (Rabeau, 1970). Overall, the decline in mobility during the 1970s may indeed have contributed to the greater disparities in unemployment rates between regions noted during that period.

## SEASONAL VARIATIONS

All things being equal, a region whose activities are affected more by seasonal fluctuations might have a higher unemployment rate than regions less subject to seasonal variations. The results of a recent study (Beaudry, 1976b) show that the highest seasonal unemployment is to be found in regions where the average unemployment rate is highest in relation to the national average, i.e., in the Atlantic Provinces and Quebec. Seasonal employment is lowest in Ontario, where manufacturing is most developed. For the time being, however, it is not possible to estimate the precise influence of industrial structure on seasonal employment.

If we remove an estimate of the seasonal component from regional unemployment, disparities in unemployment rates diminish. For example, Beaudry (1976) found that the divergence in unemployment rates in the Atlantic Provinces from the national average is reduced by more than 40 percent if the effect of seasonal fluctuations is removed. It is therefore obviously necessary to take the seasonal portion of unemployment rate disparities into account when evaluating the need for regional stabilization.

## EFFICIENCY OF THE LABOUR MARKET

Perfect wage flexibility with respect to regional labour market conditions would not be compatible with Canada's chronic disparities in regional unemployment rates. Not only have wage adjustments of this kind not been observed, but since the mid-1960s, regional wage levels have actually tended to converge, even though the differences in productivity have not narrowed at the same rate. An examination of the mechanisms behind this phenomenon is important for determining whether it would be appropriate to take regional stabilization measures.

### *Inflation and Unemployment*

It has been noted that price trends (but not necessarily price levels) are quite similar for all regions (Thirsk, 1973). As a result, the systematic

disparity noted in unemployment rates is not present in the case of regional inflation rates. At the same time, wage increases are also quite similar from one region to another:

Imperfect labour mobility and widely varying levels of regional unemployment notwithstanding, wages as well as prices exhibit a marked tendency to move together. (Thirsk, 1973, p. 18)

Studies of regional Phillips curves (see Thirsk, 1973 and Swan, 1976) have not succeeded in identifying the influence of regional labour-market imbalances on the rate of growth of wages. It thus appears that regional wage behaviour is not connected with local cyclical conditions: wage adjustments do not tend to reduce the unemployment rate in a given region. No empirical tests of this conclusion have been done recently, but it is in total agreement with trends in wages during the 1970s (Cousineau, Lacroix, and Vaillancourt, 1982). This situation might perhaps be explained, in varying degrees, by the following factors:

- The large national corporations and the federal government in general have a uniform pay policy for all regions in Canada. These employers have a direct influence on a significant portion of the labour market, while they also produce spill-over effects on local wage settlements through the market arbitration mechanism.
- In negotiations for collective agreements, the trade union movement, especially in the protected sectors of the economy where it often has considerable bargaining power, argues for wage parity with regions where wages are higher. This tactic promotes a convergence of wages and, in cases where parity is achieved, causes wages in different regions to move more or less together.
- Canada has a highly skilled work force that is more mobile than the average (Thirsk, 1973) and receives roughly uniform pay across the country. Wages paid to skilled workers would tend to push the wage structure on local labour markets upward.
- Provincial wage legislation often prevents wages from adjusting to cyclical conditions. In particular, the minimum wage is both a bottom limit and a reference for all other wage adjustments (Cousineau and Lacroix, 1977). If minimum wages are indexed or follow the national wage trend, they may tend to exert pressure on wages in the region.
- During cyclical troughs, generous unemployment insurance benefits could<sup>4</sup> induce workers to remain jobless rather than accept work that pays less than they received in their previous job (Green and Cousineau, 1976; Fortin, 1984). This could counteract a trend toward more moderate wage increases in regions that are harder hit by recessions.

More generally, the regional automatic stabilization mechanisms (see Thirsk, 1973 and Courchene, 1978) characteristic of the Canadian federal system tend to slow the wage adjustment process. For example, if there is a recession in a region owing to a decline in exports, a change in

relative prices (or a variation in exchange rates, if each region had its own currency) would be needed to ensure the region returned to balance-of-payments equilibrium. However, interregional resource transfer mechanisms (equalization payments, unemployment insurance, subsidies to high-unemployment areas, etc.) do not at present make it possible to adjust relative prices in a region by financing the region's trade deficit.

### *Structural Problems*

In a region where labour demand and supply are seriously mismatched, the unemployment rate at a given level of aggregate demand will be higher. This imbalance can be traced to the level of training of the labour force (Economic Council of Canada, 1977). In this case it is not easy to distinguish between the effects of inadequate manpower training and of the wage structure. Employers may find it difficult to recruit workers, since jobs available in lower-productivity regions are not regarded as lucrative enough by unemployed workers with below-average training. The mechanisms described above, which tend to create upward pressures on wages, are probably more to blame for high unemployment than lack of training is. It can nevertheless be inferred that, in the medium term, higher unemployment in regions with lower productivity does result from an unsuitable wage structure (Thirsk, 1973, p. 84; Lacroix and Rabeau, 1981, p. 118).

In addition to manpower training problems, it has also been suggested that the efficiency of placement arrangements and manpower retraining may vary from one region to another (Economic Council of Canada, 1977). Similarly, the generous benefits provided by the unemployment insurance program since the early 1970s may have reduced the propensity of workers to accept jobs, especially in regions with lower productivity where available jobs may not be very attractive. This would account for some of the growth of unemployment rate disparities over the past decade.

## REGIONAL FLUCTUATIONS IN ECONOMIC ACTIVITY

It should be mentioned at the outset that interregional manpower mobility affects the regional movement of unemployment rates (Vanderkamp, 1968). At cyclical peaks, workers in regions with higher unemployment move to regions with lower unemployment, and this reduces disparities at the peak of an expansion. On the other hand, in periods of recession, workers are less mobile because the likelihood of finding a job elsewhere diminishes. Also noted is a tendency of workers to return to their home region if they lose a job in a region with lower unemployment (Vanderkamp, 1971; Courchene, 1978). The combination of reduced mobility and return migration helps to increase the disparities in regional unemployment rates during recessions.

However, the unequal amplitudes of regional cycles in Canada may be explained by other factors as well:

- Owing to the significant differences in industrial structure between regions and other factors, such as distance from markets, the demand for goods and services fluctuates unequally from one region to another (Engerman, 1965; Lacroix and Rabeau, 1981).
- Even if variations in final demand were the same for all regions, derived demand for labour could exhibit unequal fluctuations from one region to another if short-term elasticity in the demand for labour in relation to output were to vary regionally because of different labour-hoarding practices.
- Lastly, differences in behaviour in the labour force participation rate could also affect the cyclical behaviour of the unemployment rate.

It is not easy to verify these various cyclical factors empirically owing to the lack of quarterly data on production by region. An attempt at an estimate nevertheless offers a few clues (Swan, 1972). One-third of the variation in the Atlantic Provinces' cycle from the national average is accounted for by more pronounced output fluctuations, and the remainder may be attributed to cyclical differences in the demand for jobs. In the case of Quebec, swings in the production cycle may be wider than the national average, but nothing of any significance in employment levels has appeared. The employment cycle for Ontario is smoother than that for the rest of Canada because its labour force is better trained and companies are thus able to avoid layoffs during recessions. Lastly, fluctuations in output are more pronounced in British Columbia (where the primary sector is very important) than in the rest of Canada; this would account for the more pronounced employment cycle in that province.

With regard to the participation rate, if casual workers appeared in greater abundance on the labour market at times of recession in regions with a high unemployment rate, this mechanism might partly explain the sharper rise in unemployment in these regions. Yet precisely the opposite is true (Swan, 1974, pp. 418–32): when a recession hits, the more pronounced effects of casual workers in regions with low unemployment rates, such as Ontario and the Prairies, somewhat amplify the effect of the recession as measured by unemployment rates. In fact, if unemployment rates were standardized to eliminate the effect of casual workers, the resulting regional unemployment rate disparities would turn out to be even greater in periods of economic slowdown.

### *A Few Conclusions*

Those who have analyzed the differences in unemployment rates and business cycles among Canadian regions have come to different con-

clusions as to the economic policy measures that might be taken to reduce disparities.

## REDUCING DISPARITIES AND REGIONAL STABILIZATION

Analysts who would like to see stabilization policy regionalized believe that a cyclical rise of final demand in high-unemployment regions will reduce unemployment rate disparities and cyclical swings. Some (Swan, 1977; Economic Council of Canada, 1977) claim that the secular disparity in unemployment rates in Canada can in part be attributed to equally secular differences in the regional distribution of aggregate demand. For example, one analysis of unemployment rates and job vacancies undertaken by the Economic Council of Canada (1977, p. 109) concluded:

The unemployment/vacancy data do favour the view that aggregate demand is deficient in certain regions compared with others, especially in recessionary and normal times, though perhaps not at the peak of a boom.

Since regional inflation rates are interrelated and do not seem to be determined by the local business cycle, a cyclical growth of regional aggregate demand should not affect regional price and wage movements; instead, it should help to increase production and employment (Swan, 1977), and consequently to reduce unemployment rate disparities. That there is little or no effect on regional inflation is fundamental since, in the medium term, more rapid wage increases could actually destroy the employment gains obtained through stabilization policy, thereby compromising any tendency of unemployment rates to converge.

But how far can unemployment rate disparities be reduced with measures designed to act on regional final demand? In the early 1970s, a labour market study in which regional full employment was defined as vacant jobs equal to the regional unemployment rate suggested that two-thirds of regional unemployment rate spreads<sup>5</sup> were attributable to differences in labour market efficiency and the balance to inadequate demand diffusion (Thirsk, 1973, p. 129). But the study does not take into account the seasonal effects discussed above, and it is based on data from the 1960s. A more recent study reached similar conclusions, though it gave no quantitative data (Lazar, 1977, pp. 126–27).

Given that a stabilization policy aimed at raising regional final demand over the cycle can reduce the average unemployment rate, disparities in regional unemployment rates could possibly be narrowed by an average amount of about 30 percent of mean differentials. If the results were adjusted to eliminate the effect of seasonal factors, the average reduction in disparities for Quebec and the Atlantic Provinces would be one percentage point of the unemployment rate.

Another approach to reducing unemployment rate disparities — the one actually adopted by the federal government — consists of attempt-

ing to increase productivity in lower-income regions. If the labour force is not sufficiently mobile, and if unemployment rate disparities are due in large part to wage rigidity and excessively high labour costs in relation to productivity, it is feasible to attempt to increase productivity where it is too low in order to eliminate cost disadvantages (Swan, 1977). First, labour retraining programs attempted to increase labour productivity; then the DREE programs of the 1970s sought to increase investment and productivity in regions with high unemployment. However, after more than 10 years of experience with subsidies for capital formation, the differences in productivity are still considerable, even though they have diminished for some regions, such as Quebec, while unemployment rate disparities have grown.<sup>6</sup>

A strategy of raising productivity does not exclude reliance on regional stabilization and may in fact complement it (Lacroix and Rabeau, 1981). But another important connection between regional stabilization and capital formation arises from the interaction between the business cycle and economic growth. If the right stabilization policies can enable a regional economy to operate, on average, closer to its potential, pressures on the capital utilization rate could lead to more rapid investment growth in the medium term (Tobin, 1980). The more vigorous growth should help reduce productivity differentials and thus make it possible to shrink unemployment rate disparities beyond what could be achieved in the short term with stabilization measures.

## DIFFICULTIES RAISED BY REGIONAL STABILIZATION

Even if budget policy is still able to act on employment and incomes — and that is now being questioned — and even if the problem of inter-regional leakage does not reduce the Keynesian effectiveness of this policy inordinately, it is not apparent from the preceding analysis that the benefits of regionalizing stabilization policy outweigh the disadvantages, especially in the medium term.

In the first place, an analysis of regional differences suggests that quite a high proportion of unemployment rate disparities is due to factors other than demand deficiency over the cycle (see especially Lazar, 1977). This indicates that, to reduce unemployment rate disparities, it may be preferable to address causes other than regional demand deficiency.

We have seen that the federal government's existing regional transfer mechanisms and the automatic stabilization they entail could, during a recession, create an obstacle to the price adjustment mechanism on a regional labour market. Now regionalization of budget policy would amplify the stabilizing effect of the existing transfer mechanisms. The temporary gains in output and employment stability could also be wiped out if regions with high unemployment were to become less competitive. Indeed, the system developed by the federal government to transfer

resources between regions has enabled some provinces to take measures for which they have not had to assume the full cost (Courchene, 1978). Measures such as regulation of the labour market and the minimum wage have actually helped to make the mechanisms more rigid and have perhaps occasioned a rise in the average unemployment rate in some regions. If regional stabilization merely magnified these distortions, it could actually exacerbate the disparities it seeks to reduce.

A regional stabilization policy might also accentuate existing perverse effects on mobility. For example, an increase of return migration could diminish or cancel any positive effects a regional stabilization policy might have in the trough of a cycle. In the longer term, the possible reduction of interregional mobility of workers might increase the disparities in unemployment rates. These distortions of market mechanisms suggest that it might be preferable to adopt policies aimed primarily at making the market more efficient.

This critique of the rationale for regional stabilization policy is reinforced by all the more general arguments regarding the effectiveness of stabilization policies as a whole (Auld, 1980). In particular, the growth of the federal government deficit during the 1970s has given greater weight to the view that stabilization measures have no effect on production and employment because of crowding-out effects on financial markets. Similarly, those who oppose stabilization policies because of their crowding-out effects or because of the disruptions they cause in the private sector will, *a fortiori*, deem attempts to implement stabilization on a regional basis to be futile.

## **National and Regional Economic Stabilization: Review and Empirical Studies**

### ***Introduction: A Retrospective***

The orthodox Keynesian view that prevailed during the 1950s assigned to the federal government the responsibility for administering stabilization policy. This opinion is expressed, for example, in the budget speeches of federal and provincial governments alike. In addition to controlling the money supply, the federal government received almost all personal and corporate income tax; it also accounted for almost two-thirds of government expenditures on goods and services (including capital formation) in Canada.<sup>7</sup> The federal government thus controlled the principal stabilization instruments. Furthermore, the provincial administrations were still of modest size and did not really concern themselves with the problems of administering macroeconomic policy. In fact, in the Keynesian context of the 1950s, it was believed that the provinces and municipalities could be a source of final-demand *instability* because of their budgetary constraints. According to the perversity hypothesis (Rafuse, 1965), reve-

nues with a certain elasticity relative to the business cycle could oblige lower-level governments to reduce their expenses in a recession so as to avoid, or at least limit, borrowing on financial markets.

Mainly under the influence of Quebec, which sought greater power to tax and spend in the early 1960s, the structure of public finance underwent a major transformation during that decade. In particular, Ottawa's share of direct taxes slipped noticeably. The federal share of total spending on goods and services in Canada dropped sharply, as a result of the rapid growth in expenditures by provincial and municipal governments as well as a decline in the proportion of military spending.

This shake-up of the structure of public spending caused some anxiety at the federal level. The Carter Report (Canada, Royal Commission on Taxation, 1966) and the Department of Finance (Canada, Ministry of Finance, 1966) expressed the opinion that provincial government budgets might eventually become a source of macroeconomic instability if provincial spending continued to displace federal spending and if provincial revenues were increasingly obtained from sources that were sensitive to the business cycle, i.e., direct taxes. At the same time, the growing size of provincial governments forced them to become more concerned with stabilization questions. With the largest regional economic base, Quebec and Ontario in particular began to consider the possibility of intervening in the economy to ensure greater cyclical stability.

The transformation in the structure of public finances in Canada during the 1960s was followed by a consolidation of the federal government's fiscal powers in the 1970s. This meant a stabilization of Ottawa's share in direct taxes and an appreciable increase in its responsibility for some forms of expenditure, such as transfers to individuals. The fears expressed by the federal authorities fifteen years earlier that they would no longer be able to perform their duty of stabilizing the economy because their taxing and spending powers had been eroded were not borne out in the 1970s.

In fact, the federal government's ability to stabilize the economy has probably grown continuously since the mid-1950s (Fortin, 1982b). Government spending, which stood at around 17 percent of GNP in the 1950s, reached 21 percent in the last decade despite a decline in Ottawa's share of purchases of goods and services. Transfers, which are more sensitive to the business cycle than spending on goods and services, may even have improved the federal budget's capacity for automatic stabilization. Total provincial government spending — which grew considerably between the 1950s and the end of the 1970s, while its proportion of GNP jumped from 6 percent in 1955 to almost 19 percent in 1980 — has still not displaced federal expenditures, since the share of Ottawa's spending has continued to expand. However, the decline in the federal government portion of spending for goods and services may have weakened its capacity for *discretionary* intervention (Lacroix and Rabeau, 1981). As

for revenue, not only has the federal government kept the lion's share of direct taxes, but the fraction of GNP represented by direct taxes has not diminished since the 1950s.

The growing share of provincial government spending in the GNP has, to a great extent, been ascribed to an expanded role for the provinces in the area of direct taxes and an increase in federal transfer payments. From the point of view of the perversity hypothesis, one would need to know if the growth of provincial governments, which has resulted in a displacement of private spending by provincial spending — financed to an increasing degree by direct taxes, which are sensitive to cyclical fluctuations — has reduced the stability of the Canadian economy as a whole. At the same time, the larger provincial budgets and the provinces' own interest in stabilization persuaded the federal government to seek provincial cooperation for cyclical stabilization during the 1970s.

This brief retrospective introduces the questions that will be analyzed in this section. An empirical examination of the federal government's performance in the field of stabilization is one of the first aspects dealt with in the literature. It will also be interesting to see whether there have been changes in the federal government's stabilization function corresponding to the growth of provincial budgets. Another empirical question deals with the role the provinces have played in stabilization. The relation between the size of the federal and provincial governments and the federal government's capacity to stabilize the economy has also been examined in the literature. Lastly, the problem of regional stabilization and interregional leakage has been addressed in a number of empirical studies.

### *Cyclical Stabilization by Level of Government*

Studies of stabilization by level of government in Canada consist sometimes of qualitative examinations of federal government budgets (Royal Commission on Taxation, 1966; Lacroix and Rabeau, 1981) in which proposed measures are compared with cyclical needs. Other studies entail econometric analyses of cyclical movements of revenues and spending by different governments (Robinson and Courchene, 1969; Auld, 1980; Lacroix and Rabeau, 1981). Still others have concentrated on the influence of provincial budgets on local economies (see especially Rabeau, 1970, 1976 and Auld, 1975). In these studies, tests of governments' stabilization performance are based essentially on a comparison of the behaviour of real activity and budgets. The trade-off the federal government can make between inflation and unemployment is discussed relatively little in most studies of fiscal performance. The studies assume that at the regional level real activity is the main concern, while inflation is more a national problem. Lacroix and Rabeau (1981) have done a complete update of the 1969 Robinson and Courchene econometric study of the stabilization record of the different governments in Canada.

Based on an examination of chronological series illuminated by a study of the main institutional changes in Canada, the authors distinguish three periods: 1952–65 (the period considered by Robinson and Courchene in their study), 1966–I–1971–III, and lastly, 1971–IV–1976–IV.

### 1952–65

The federal budgets during this period exerted a clearly stabilizing influence on the economy as a whole. This effect is essentially due to automatic stabilization brought about by revenues and some expenditures such as unemployment insurance. All federal government spending had a stabilizing effect during this period. However, empirical tests suggest that the federal government did not make *discretionary* use of categories of expenditures that might have had a countercyclical effect.

Robinson and Courchene found that the provinces and municipalities did have a stabilizing influence on the economy, despite their procyclical spending behaviour. (The latter was counterbalanced by the stabilizing effect of revenues.) Conversely, Lacroix and Rabeau, with revised data, have been unable to draw any conclusions regarding the behaviour of the provinces and municipalities for this period from their statistical tests. Also, as a whole, the provinces and municipalities do not seem to have exerted a destabilizing influence during the 1952–65 period and in this case the perversity hypothesis would appear not to be confirmed.

### 1966–71

The stabilizing character of federal government taxing was enhanced during this period compared to the preceding period, despite the tax agreements entered into during the 1960s. However, unlike the previous period, federal government spending as a whole played a clearly destabilizing role. The destabilizing effect of spending was large enough to cancel the greater stabilizing impact of revenues, with the result that budget surpluses were no longer tied to the business cycle. Consequently, the tests indicate that the federal government's fiscal policy during this period was inadequate for macroeconomic purposes.<sup>8</sup>

Provincial tax receipts played a greater stabilizing role in the wake of the tax agreements. Nevertheless, there is no significant connection between provincial government budgets and the economic cycle. This can be ascribed to the absence of stabilizing contribution by spending. Once again, no hypotheses can be confirmed for lower-level governments.

### 1971–76

As a result of the tax reform, the role of federal government revenues in stabilization once again expanded during this period. As before, all

expenditures had a regulating effect. Changes made to the unemployment insurance program also enhanced the automatic stabilization effect of government spending. In addition, the federal government budget exerted a stabilizing influence during the period. However, the tests show that any regulatory effect on economic activity was due mainly to the automatic stabilizing components of the federal budget.

Albeit to a significantly lesser degree than the federal government, the provincial governments also exerted a stabilizing influence on the economy. The provinces' revenues and spending played a regulatory role during this period. Lastly, the budgets of municipalities as a whole once again remained independent of the business cycle.

The following conclusions may be drawn for the entire period analyzed above (1952 to 1977):

- First, it must be mentioned that marginal spending elasticity with respect to GNP remained higher than one for all three periods. The federal government expanded its share in the economy continuously throughout the three decades (Fortin, 1982b).
- The automatic stabilization value of federal government revenues and spending increased dramatically over the period. In terms of real activity alone, the federal government budget was generally stabilizing, apart from a few important exceptions. It would seem that a large part of the economic regulator effect of the federal budget must be ascribed to its automatic stabilization value. Certain budget items that might have been able to play a discretionary stabilization role never exhibited countercyclical behaviour. As well, the problem of the inappropriateness of stabilization policies to regional economic needs emerges both from the fact that the federal government's stabilization function was not regionally differentiated and — perhaps more importantly — from its ill-advised macroeconomic orientation compared to the high-employment objectives the provinces are able to pursue.<sup>9</sup>
- The “perversity” hypothesis has not been confirmed for the case of provincial and municipal budgets. Provincial budgets begin to have a stabilizing character in the mid-1960s, and do in fact exert a stabilizing influence on the economy in the 1970s, though to a lesser extent than the federal government. But the provinces do not seem to have played an active part in stabilization and no discretionary movement in this direction is noted.<sup>10</sup>
- Lastly, municipal budgets, though exerting no destabilizing influence, are not tied to cyclical movements.

### *Stabilization Instruments and the Levels of Government*

This analysis of fiscal performance will conclude with an examination of the main fiscal measures proposed by the federal government. This

examination will concentrate on relations between levels of government and the regional implications of discretionary measures. An analysis of federal government budgets leads to the following conclusions:

- Before the 1970s, the federal government often used direct taxes as a means of stabilizing the economy. This manipulation of taxation was undertaken with a view to fine tuning the economy. Then, in the 1970s, Ottawa began to use structural rather than cyclical adjustments to its taxation, adopting measures such as indexing. This new approach is primarily a result of a change of philosophy that took place in a number of countries where taxation was used for economic stabilization. The studies suggest that variations of direct taxes in general constitute less effective stabilization instruments than spending.<sup>11</sup>
- But Lacroix and Rabeau (1981) also claim that the federal-provincial quarrels over tax sharing have induced the federal government to give up reducing its direct taxation for stabilization purposes for fear the provinces may use stabilization as a pretext to increase their share of tax receipts. The Ontario Economic Council (1983) sees the present structure of tax agreements between the federal government and the provinces as an incentive for the latter to use personal income tax to stimulate the economy, whereas in fact only Quebec levies its own tax. The federal tax thus has a strong leverage, since changes in federal tax structure are also transmitted to the provincial tax component. The federal government should also be urged to use this stabilization instrument in times of recession, given that one-third of the deficit created by a tax cut appears in provincial budgets (Ontario Economic Council, 1983). But during the 1970s, the federal government did not use individual taxes to stimulate the economy in any large way. In the 1980s, the federal government's recovery program during the Great Recession was based on spending rather than taxes.
- Spending used for stabilization purposes should be flexible and therefore non-recurrent. Yet during the analysis period, the federal government quite frequently used recurrent expenditures, such as transfers to individuals or to provinces, for explicit stabilization purposes. This method of stabilizing the economy has led to an expansion of the federal government slice of the GNP. This development, which has an influence on the stability of the economy (Fortin, 1982b), has not been entirely independent of stabilization measures. Beginning in the 1970s, the federal government used so-called "job creation" programs to deal with the unemployment problem. Once again, stabilization spending since the mid-1970s has, to a great extent, become recurrent, while it has also contributed to increasing Ottawa's share of the GNP.

However, the federal government's attempts to use flexible spending, such as Gross Fixed Capital Formation (GFCF), have in part been a failure (the most noteworthy case being in 1958); when they have

succeeded, the amounts injected were still too low in relation to the needs of the economy (including the attempt made in 1983). In short, the analysis of budgets indicates that, since the end of the 1950s, there has been no major discretionary use of truly flexible spending for stabilization purposes.

- Meanwhile, in 1971 the federal government decided to make use of the powerful fiscal lever of provincial and municipal capital spending, and proposed to increase their GFCF with federal credits. In 1978, the federal government offered the provinces a formal exercise in federal-provincial cooperation for stabilization purposes, which consisted of a reduction of provincial sales taxes combined with a partial refund of subsequent losses.

At the provincial level, there are few examples of discretionary measures of any significance being used for stabilization purposes, despite the powerful levers the provinces possess and their increasing interest in stabilization. Quebec, Ontario, Alberta and British Columbia have taken some fiscal measures in attempts to influence their local business cycles (Fortin, 1982a).<sup>12</sup>

### ***Growth of Provincial Governments and Ottawa's Stabilization Capacity***

Ottawa's fears of losing its ability to play a stabilizing role in the event of a transfer of its taxing power to the provinces do not appear to have been borne out empirically. A more formal analysis of the question will enable us to better evaluate this aspect.

Using a macroeconomic model in which the taxation and government transfer functions are articulated, Fortin (1982b, pp. 3–4) demonstrates two interesting propositions:

- The size of the government, as measured by the relative size of its purchases of goods and services, acts as an automatic economic stabilizer in the same way as the marginal rate of net taxation; this result follows from the fact that an increase in government size reduces the share of the private sector in final demand, and consequently a given percentage change in private demand will have less effect on economic activity.
- The larger the government's expenditures on goods and services and its total budget are in relation to GNP, the less the importance in the budget of any discretionary measure designed to exactly offset the effect on national income of a given disturbance of autonomous private demand.

Combining these propositions with the preceding empirical results, we may conclude that since the war the stabilization capacity of the federal budget has improved continuously, i.e., both the automatic aspect and

the discretionary aspect of its stabilization function. Moreover, the increase in the size of the federal government has reduced the requisite dimensions of discretionary measures as a fraction of the budget. Finally, since revenue and spending now have a greater automatic stabilization capacity, it can also be assumed that the necessary frequency of discretionary measures has diminished.

Furthermore, provincial spending, which has increased considerably since the 1960s, has not “displaced” federal spending, since the latter has tended to grow as a proportion of total economic activity. Therefore, the question that arises in the Canadian federal system is, instead, whether the displacement of private spending by provincial expenditures and the financing of the latter through direct taxes have strengthened or weakened cyclical stability in Canada. To answer this question, completing Fortin’s model by adding one more level of government, we may distinguish different cases. Either the provinces are involved only in pure automatic stabilization (provincial propensity to stabilize — PPS — equal to one); or the provinces pursue a procyclical policy (PPS equal to zero — and this is the case with the perversity hypothesis); or the provinces are actively involved in economic stabilization (PPS greater than one). Or lastly, the provinces have a partly stabilizing behaviour, but the budget remains procyclical (PPS less than one).

On the basis of the preceding empirical analysis, we can estimate that the provincial propensity to stabilize is approximately equal to one. Under these circumstances, it can be shown that an increase in the provinces’ net tax rate<sup>13</sup> would in fact be stabilizing. It can then be deduced that:

A simple transfer of personal or corporate income tax points from Ottawa to the provinces, accompanied by an equivalent transfer of spending responsibilities, would have no real consequences on the cyclical stability of the economy. (translation) (Fortin, 1982b, p. 18)

The answer to our question can thus be summarized in three points: first, the displacement of private by provincial spending has improved the economy’s capacity for self-stabilization. Similarly, increased financing of provincial expenditures by direct taxes may also have contributed to the intrinsic stability of the economy. Lastly, a transfer of tax resources and spending responsibilities from the federal level to the provincial level would leave the sensitivity of the economy to variations in aggregate demand unchanged.

One final question of interest is raised by the evolution of the Canadian federal system in relation to the federal government’s capacity for stabilization: have expanding provincial budgets altered the ease of federal discretionary intervention? It can in fact be shown (Fortin, 1982b) that the growth of provincial budgets does not make federal discretionary intervention any more difficult. In order for that to happen, the

instability of expenditures and autonomous provincial income taxes would have to be greater than that of autonomous private demand, which is contrary to the empirical results presented.<sup>14</sup>

Finally, a transfer of tax resources from the federal level to the provinces accompanied by a corresponding transfer of spending responsibilities would lower the federal government's aggregate budget but leave the public sector's consolidated share of expenditures in final demand unchanged. Consequently a transfer of this kind does not change the absolute amount of federal discretionary intervention required by the business cycle, even though the relative size (as a fraction of the reduced federal budget) of the intervention would be increased, and could make Ottawa more hesitant to introduce the appropriate measures.

In reality, it all depends on what type of spending responsibilities are decentralized. If the spending is non-recurrent, flexible and well-suited to use for stabilization, the discretionary capacity of the federal government would be reduced. In this case, federal-provincial cooperation for stabilization would be crucial since the stability of the economy would depend on the provinces' will to fill in for the federal government and use this instrument for cyclical regulation. If, on the other hand, the expenditures are recurrent and not very flexible, such as spending for education or health programs, decentralization will have little effect on the federal government's ability to use discretionary intervention for cyclical purposes. This type of program in particular was involved in tax transfers to the provinces during the 1960s. The resulting redistribution of powers has probably not changed the federal government's discretionary power to regulate the business cycle in any major way.

### *Regional Stabilization and Provincial Multipliers*

In the 1960s, some authors objected to the idea of regional stabilization because they believed import leakages into a region were so great that regional multipliers would be too weak to be able to act on the local business cycle effectively through fiscal policy. Without checking their conclusions empirically, Oates (1968) in particular and the Carter Report clearly expressed their skepticism about the possibility of effective discretionary intervention in the regional business cycle.

The empirical studies of the 1970s subsequently showed that regional spending multipliers are distinctly higher than the crossed multipliers and that the portion of the impact of a discretionary budget measure that "remains" in the region in which the measure originated is in general large enough to make it possible to use budget measures to act on regional economies effectively in the Keynesian sense.

In an early article preceding a whole series of studies of regional multipliers, Miller (1971) noted that the part of the effect of a rise in

federal government spending that remained in the region was around 75 percent for Ontario and Quebec and more than 61 percent for the Atlantic Provinces. This preliminary finding was confirmed in part by work by Guccione and Gillen (1974) who found that, except for Atlantic Canada, more than 50 percent of the impact of federal spending in a region remained in the region.

Subsequently, using an interprovincial input-output model, Zuker (1975) obtained even more exact results which showed that a higher proportion of the multiplier effect remains in a region. More precisely, for a variation of federal government spending on goods and services in a region, Zuker's findings are as follows:

**TABLE 4-2**

(1976) Region	Percentage of the Multiplier Effect within the Same Region
Atlantic	74.9
Quebec	83.4
Ontario	91.7
Prairies	76.5
British Columbia	81.7

*Source:* R.C.Zuker, "Input-Output Modelling," seminar given at the Department of Economics, Université de Montréal, April 1980.

Later work by Zuker (1980) showed that the multiplier effect of an increase in household incomes in all the regions of Canada is considerably lower than for an increase in spending. In the case of a rise in income, the regional multiplier is higher for large regions such as Quebec and Ontario, since these provinces supply a large share of consumer goods in Canada. In the case of an increase in construction spending, regional multipliers remain high for all regions compared to the case of an increase in household incomes. This shows that studies of regional multipliers do provide indications as to the choice of instruments available to the federal government or the provincial governments to achieve regional stabilization objectives.

Even more recently, Miller (1980) devised an interregional model in which he used Statistics Canada data on provincial economic accounts and information from interprovincial exchange tables to obtain tax and spending multipliers. His findings confirm those obtained by Zuker. The multiplier effect resulting from a variation of taxes is lower, for all regions, than the effect of an increase in government expenditures. The regional multiplier is higher for large regions, but still substantial for all regions.<sup>15</sup>

Fortin (1982a) also returned to Zuker's work and obtained further interesting results. Fortin's calculations make it possible to distinguish what he calls a pure regional measure in which, for example, government expenditures are increased in a single region, from a federal measure, in which there is an injection of spending in one region accompanied by

parallel injections in other regions. The results of his calculations indicate that, when we switch from a purely regional measure to a federal measure, the increase in the multiplier effect is not as great as might have been expected. This means that, depending on the region, the regional multiplier is a very large part — between 76 percent and 89 percent — of the federal multiplier. So if a province endeavours to stimulate its economy with its own spending, its impact will not be very different from that of a federal government policy targeting all regions. Fortin's calculations also give an idea of the effect of a cooperative effort on two provinces: if Quebec and Ontario undertook jointly to inject spending into both provinces, their regional multipliers would be raised to 87 percent and 90 percent respectively of federal multipliers.

Although our knowledge of the interregional economic linkages in Canada is still incomplete, the many studies of the question do suggest that direct regional multipliers are, in general, high enough that regionalization of fiscal policy would be effective in the Keynesian sense. The federal government could, for example, achieve some success if it were to differentiate its fiscal policy along regional lines. A province acting on its own could also influence the economy, but it would be preferable if it acted in concert with the other provinces or with the federal government. Lastly, with regard to instruments, the macroeconomic findings (i.e., that taxation is a less effective means for achieving stabilization objectives) are also confirmed at the federal level. As for government expenditures as a form of intervention, regional input-output studies suggest that construction spending possesses the highest direct multiplier effect.

Little is known about the time required by the economy to adapt at the regional level. The lack of regional quarterly economic accounts makes it impossible to give a clear answer to this kind of question as yet. Miller and Wallace (1982) recently began to explore these questions, proposing a dynamic version of estimates of regional multipliers in Canada. They show that in the case of government expenditures, the first round and dynamic multipliers are high, with 80 percent of the effects appearing after three years for most provinces. Meanwhile, in the case of a variation in taxes, adaptation lags are so long that the policy is not very effective. This is not surprising since in their model, regional consumption depends on permanent income. Time lags would therefore be so long as to prevent effective use of a regionally differentiated policy based on a manipulation of personal income tax. But as Gussen (1978) has shown, the time lags entailed in using the sales tax are short enough that this instrument can be used effectively at the regional level. Further to this initial assessment of dynamic multipliers, Miller and Wallace (1982, p. 546) concluded:

These results clearly show a substantial *short run* impact for government expenditures policies. Provided therefore, that governments can forecast

one year ahead, not with complete accuracy but with some rough idea of whether stimulus or restraint is required and whether the dosage should be large or small, countercyclical expenditures policies can be implemented on a regional basis with some hope of success.

## Principles of Stabilization Policy and the Regions

### *Responsibility for Stabilization Policy*

In a federal system such as Canada's, one might wonder who should have responsibility for administering stabilization policy. Should we favour a model in which the federal government intervenes alone? Or could we conceive of the provinces having primary responsibility for stabilization? Or lastly, should the federal government play a determining role in stabilization, while allowing or even *facilitating* participation by the provinces in the task of regulating the economy?

In studies of this question during the last two decades, a trend has emerged, which can be summarized as follows:

- Many arguments favour the federal government having *primary responsibility* in the task of regulating the economy. But there are also several advantages in involving the provinces in the stabilization process.

### FEDERAL GOVERNMENT RESPONSIBILITY

One argument in favour of the federal government taking primary responsibility for stabilization is based precisely on the disparities in participation rates between regions and the need for Ottawa to find an acceptable macroeconomic trade-off between inflation and unemployment. With regard to lowering the unemployment rate in Canada, it is possible that the regional utilization rate structure requires a demand stimulation policy in some regions and, at the same time, a neutral or even a deflationary policy in others. Only the central government, by giving priority to the national objective of its intervention, can ensure the proper regional dose of stabilization policies.

In fact, if the regions had full responsibility for stabilization, it is not very likely that stabilization policy could be apportioned regionally in this way. Since there appears to be no difference in inflation rates between the regions, the provincial governments would not be inclined to balance inflation and unemployment and would never find their unemployment rates low enough to apply a restrictive policy (except if their budgetary constraints forced them to adopt deflationary measures). A continued stimulation of demand, especially in regions with low unemployment, would raise the national inflation rate and weaken our ability to compete on international markets, thereby creating serious problems

for all of Canada in the medium or long term. Moreover, in the absence of federal balancing, excessive stimulation in some regions could encourage return migration to regions with higher unemployment.

If primary responsibility for stabilization were to rest with the provinces, linkages between the various regions would raise a problem of coherence for the task of economic stabilization, already noted by the Carter Commission (Vol. 2, pp. 102–103). A hopelessly chaotic situation could arise if the provincial governments directed their policies toward different aims and if their interests varied at different times.

Indeed, would the provinces even have sufficient means to ensure adequate stabilization of their economies? This question raises problems of budget feedback and control of the money supply.

Because of interregional leakage, when a province adopted a stabilization measure such as a spending increase, it would recover part of the initial cost of the measure in the form of higher taxes and lower expenditures, though this part would be smaller than that recovered by the federal government even on the assumption that the tax rates of both governments were the same. The larger federal government recovery is accounted for by the fact that its tax rates apply to all incomes generated in Canada by a fiscal measure, and also by the fact that expenditures associated with automatic stabilization, such as unemployment insurance, fall to a greater extent than provincial expenses. If, in addition, the federal government's share in taxes on the revenue of all levels of government in Canada is taken into account, the following results are obtained: for each additional revenue dollar in Canada, 28 cents return to the federal treasury and 10 cents accrue to the provinces (Fortin, 1982a). The costs of a stabilization measure thus appear much higher for a provincial treasury than for Ottawa.<sup>16</sup> This important difference in cost could make the provinces reluctant to take the necessary measures during recessions.

In addition to receiving insufficient budget feedback, the provinces, because they do not control the money supply, might hesitate to incur large deficits over the extended period necessitated by a prolonged slowdown of their regional economies (Wilson, 1977 and Auld, 1977). The provinces' budgetary constraints might prevent them from assuming primary responsibility for stabilization, since they do not have access to the central bank. However, in this connection, Fortin (1982a) maintains that the provinces' borrowing costs are not so different from the federal government's. If this is true, the lower level of provincial budget feedback would be an even more significant obstacle to a provincial role in stabilization.

With regard to financing stabilization, independent implementation of stabilization by eleven governments capable of incurring deficits clearly increases the danger of crowding-out effects on financial markets in Canada (Auld, 1980). Unlike the provinces, the federal government is in

a position to manipulate its fiscal action on the economy by adjusting the money supply. The effectiveness of fiscal policy can be enhanced if part of the deficit increment is monetized. In the case of the provinces, assuming a closed economy, this moderating effect on financial markets and interest rates does not exist, since their debt is entirely financed through borrowing. Furthermore, a province that made extensive independent use of its borrowing capacity to stabilize its economy could in fact enjoy some success, but it could also — in varying degrees depending on the point in the cycle — impose costs on other provinces by creating upward pressures on interest rates, and thereby reducing the volume of private investment in other regions (Wilson, 1977).

But in an open economy such as Canada's, the provinces have, in the past, frequently had to rely on borrowing on international markets to finance their deficits. In a fixed or managed exchange rate system, monetary policy must regularly counter the repercussions (Wilson, 1977) of uncoordinated budgetary decisions on the part of the provinces. This complicates the task of the central bank in pursuing a coherent monetary policy and makes it difficult for the federal government to implement the right combination of fiscal and monetary policy for a maximum impact on the economy. In a flexible exchange rate system, large-scale foreign borrowing would exert pressures on the Canadian dollar and therefore affect exports from all regions.

Lastly, the question of federal government responsibility for stabilization also arises in situations that could be called emergencies, when exceptional measures are deemed necessary. In such cases, exchange control measures, or even legislation aimed at controlling prices and wages, would be desirable.

By virtue of its constitutional role, the federal government can take such exchange control measures as may be dictated by the position of our foreign account. On the other hand, wage and price controls pose a more complex problem with regard to the responsibility for stabilization policy, since the provinces' jurisdiction over private contracts does not allow the federal government to take legislative measures without prior agreement from the provinces. In certain respects, wage and price controls can be objected to precisely because of the resource and equity problems they raise. But beyond these technical problems, that of primary responsibility for implementing a wage and price control policy in Canada is also raised. Here too, the provinces might be less sensitive to the national implications, especially for the foreign trade balance, of an inflation that persistently remained above that of our competitors. Presumably the federal government, invoking the national character of its intervention, should at least assume responsibility for proposing wage and price control measures when they are required by domestic conditions.

We may conclude from this discussion that in the Canadian federal

system, there are several advantages in the federal government having primary responsibility for regulating the economy.

## PROVINCIAL STABILIZATION OF THE ECONOMY

But there are also several advantages to integrating the provincial governments into the process of regulating the economy. First of all, by acting alone, the federal government would push "the use of the money supply and the budget for stabilization purposes *beyond* what would be required in a context of provincial cooperation, but *short* of the level required for equally effective stabilization without the provinces' cooperation" (Fortin, 1982b, pp. 1–2). Moreover, excessive use of federal intervention instruments would tend to make less likely the achievement of other economic objectives.

Failure to use provincial instruments for cyclical regulation would necessarily limit the possibility of giving the economic stabilization function a regional dimension. The use of fiscal policy for macroeconomic stabilization has a regional impact, though it does not necessarily correspond to what would be desirable for the behaviour of the regional economies.<sup>17</sup> Furthermore, any attempt by the federal government to use its taxes or spending to meet the economic needs of the regions would encounter serious difficulties with effectiveness and equity. Any politically feasible regionalization of federal budget policy would be too small in scale to be effective (Fortin, 1982a, pp. 2–4).

Moreover, only provincial stabilization instruments can be counted on as the chief vehicle of a truly regional cyclical regulation policy. In technical terms, the participation of the provinces is justified on the basis of the principle of the diversification of intervention instruments in a market where the number of objectives is generally greater than the number of instruments available to government authorities.

Yet comparative analysis of the stabilization instruments at the disposal of the federal and provincial governments suggests (Lacroix and Rabeau, 1981) that the latter do possess an important fiscal lever that can be used effectively for stabilization purposes. If expenditures are to be used for stabilization purposes, they must be non-recurrent, and therefore flexible and readily modified. This means that several categories of federal budget expenditures are not available as stabilization tools, unless the central government agrees to continue to increase its share of GNP to further its anti-cyclical policies (Lacroix and Rabeau, 1981). Although Lacroix and Rabeau have probably overestimated the lack of flexibility of federal spending (Auld, 1980), the recurrence of several federal government expenditures nonetheless limits Ottawa's capacity to intervene. The provinces and municipalities, however, control 85 per cent of public Gross Fixed Capital Formation in Canada: this is a flexible form of expenditure whose multiplier effects are generally high and

which also evidences low interregional leakage. Moreover, on average the provinces' expenditures on goods and services may also be a more flexible instrument than federal government spending (Lacroix and Rabeau, 1981). Moreover, provincial involvement in regulating the business cycle would provide access to stabilization instruments that are both effective from the Keynesian point of view for the whole Canadian economy, and better suited to giving stabilization a regional dimension.

### *Objectives of Stabilization and Intervention*

When the problem of regional stabilization in Canada is being considered, fiscal policy is generally thought of as being used to regulate the business cycle, whereas monetary policy is reserved primarily for objectives of an international scope. Of course this is the familiar Flemming-Mundell model in which, under a system of fixed or managed exchange rates, fiscal policy is regarded as more effective for the pursuit of national objectives related to production, prices and employment.

That monetary policy is directed to external balance considerations in the framework of regional stabilization is due essentially to the fact that Canada's high capital mobility would make a regionally differentiated application of monetary policy impossible. While this division of labour is compatible with the pursuit of regional stabilization objectives, monetary policy nevertheless continues to have a strong influence on economic activity and prices in Canada, even though its role is necessarily tied to U.S. policy (Wilson, 1977). From the point of view of regional stabilization, these effects must be taken into account in order to establish the proper dose of fiscal policy in relation to regional production and employment objectives.<sup>18</sup>

This division of responsibilities should be most effective in the Keynesian sense<sup>19</sup> in a system of fixed exchange rates. Under such a system, fiscal and monetary policies are no longer independent, since a given variation in fiscal policy will trigger an offsetting adjustment in monetary measures to maintain balance of payments equilibrium. The efficacy of fiscal policy for internal stabilization will tend to diminish as a flexible exchange rate system is approached. Fiscal policy should still be effective under managed exchange rates, but less so than in a fixed exchange rate system (Wilson, 1977).

In this context, by assigning objectives relating to the national business cycle to its fiscal policy, the federal government (with or without the cooperation of the provinces) could regionalize its stabilization policy by establishing utilization rate objectives for each region. The national unemployment rate would then be just a weighted average of the regional rates chosen as fiscal policy targets. Moreover, since regional inflation rates appear empirically to be more or less equal, the choice of regional target unemployment rates — and thus implicitly a national rate —

would also determine a national inflation rate, i.e., a particular combination of unemployment and inflation on the short-term Phillips curve for Canada.

The adoption of a number of regional stabilization objectives raises the question of the choice of instruments, especially since the interdependence of the targets chosen could necessitate a quite different fiscal policy in each region owing to interregional leakage. Admitting that individual and corporate income tax should, for reasons of equity and fiscal tradition, be the same throughout Canada, if Ottawa were to assume sole responsibility for stabilization, it would have to rely mainly on its own spending power to achieve its objectives. It would thus be preferable for the provinces to be involved in some way in the task of regulating the business cycle. By the same token, Brainard's principle (1967) — which states that several stabilization instruments should be used in moderation rather than a smaller number more intensively when there is uncertainty about the multipliers — suggests a fortiori that the taxing and spending capacity of the provinces should be brought into stabilization policy strategy.

Lastly, discussing stabilization policy in the framework of a pure monetary model would, in principle, be of no use. Each region would have its own natural unemployment rate, and monetary policy would make it possible to choose nominal targets such as the exchange rate and price behaviour. If this were the case, the federal government and the provinces would balance their budgets over the cycle and clearly enunciate the rules for administering fiscal policy without discretionary intervention to stabilize the economy. This means (Wilson, 1977) that the national impact of a fiscal policy financed by borrowing on financial markets would be nil because of a total crowding-out effect (if we accept the monetarist hypothesis). But in this case a provincial fiscal policy could affect local economic activity to the detriment of economic activity in other regions where crowding-out was taking place (Wilson, 1977).

### *Models of Regionally Differentiated Stabilization Policy*

Provincial involvement in economic stabilization does promise certain benefits, though the way to achieve them in the framework of the Canadian federal system remains problematic. The model that would theoretically allow the greatest flexibility in implementing a stabilization policy with regional objectives would be one of full cooperation: this would require a national body with responsibility for implementing the stabilization policy. Such a "Super Finance Department" would have the following instruments at its disposal: federal tax rates and structure, provincial tax rates and structure, all federal spending, all provincial spending, and possibly some municipal expenditures. The problem of

stabilization could then be envisioned as a programming problem with targets and instruments.<sup>20</sup>

The Canadian political reality hardly makes a model of total cooperation a feasible goal. A model that approximates total cooperation would be a *partial cooperation* model, whereby governments might agree to pool some of their stabilization instruments and maintain a degree of federal-provincial coordination of the stabilization function. However, since partial cooperation involves using only some stabilization instruments, regional objectives will be more difficult to achieve. On the other hand, partial cooperation would not necessarily presuppose an agreement on specific stabilization objectives between the various parties. In this model, moreover, Ottawa and the provinces could adopt stabilization measures over and above those covered by institutional agreements when their own goals dictated. The impact of such an exercise in partial cooperation on the business cycle would thus be the result of an interaction between cooperative and independent measures adopted by the governments concerned.

A final possibility is a model that could be described as *ad hoc* cooperation. In this model, the provinces (or a group of provinces) and the federal government would agree to implement certain stabilization measures when the participating governments decided that they had an interest in giving their fiscal policy a specific orientation in response to the needs of the business cycle. The measures in the 1971 federal budget respecting provincial capital formation, the establishment of the Anti-Inflation Board in 1975 and the reduction of the sales tax in 1978 can be seen as components of an *ad hoc* cooperation.<sup>21</sup> There would be no regional stabilization targets, and no previously identified set of instruments earmarked for stabilization by the federal government and the provinces. The impact of *ad hoc* measures on the business cycle would be assessed for each case in terms of goals agreed upon at the time the discretionary measures were implemented.

Since the war, stabilization policies in Canada have generally been formulated without cooperation between levels of government. We may thus speak of an *uncooperative* model. In this model, the federal government essentially chooses its stabilization policy according to cyclical macroeconomic needs and may occasionally adopt specific regional measures. It may use different consultation arrangements to persuade the provinces (i.e., by moral suasion) not to impede its policy, or encourage them to support its stabilization efforts. Consultation arrangements between the federal government and the provinces — especially meetings between finance ministers to discuss the state of the economy — enable all the governments in the country to keep abreast of economic forecasts and discuss measures that might be taken. But in this uncooperative scheme, each government remains free to act within its own budgetary or political constraints.

In the uncooperative model, a province can regard stabilization as a responsibility of the federal government and not intervene in the stabilization of its economy. Or, using its stabilization instruments, a province might either partly attenuate the effects of a federal policy it deems unsuitable or reinforce a policy it regards as timely. In this context, given the direct effect of federal discretionary measures on a province (e.g., a rise in individual income tax) and its indirect effect resulting from interprovincial leakage, it would be difficult for a single province to completely reverse the impact of a major stabilization policy of the federal government (Rabeau, 1970).

### *Budgets and Cooperation*

A joint federal-provincial fiscal policy involving regionalization of the stabilization function in any kind of cooperative scheme would presuppose closer collaboration in drawing up and tabling budgets than at present. Joint action to influence the business cycle at any given time would require that budgets be tabled at dates dictated by the needs of the economy. The problem of coordinating a cooperation scheme involving eleven governments would be quite complex. We have already seen that regional cycles are not perfectly synchronized in Canada. As a result, the time when stabilization measures are to be applied could vary from one region to another. Federal-provincial cooperation would thus have to allow for implementation of discretionary measures according to a variable timetable established with reference to regional cycles.

For institutional and technical reasons, federal and provincial government action under the present uncooperative scheme is not synchronized beforehand. Because of differing opinions on the needs of the business cycle and different timetables for drawing up budgets, provincial budgets are not tabled at the same time as the federal budget. Arrangements for consultation between the federal government and the provinces on the business cycle should help the various governments become more quickly aware of the need to intervene. However, the restrictions on the exchange of information between governments imposed by the confidentiality that now surrounds the preparation of each government's budget constitute an obstacle to effective consultation on stabilization policy.

With regard to ad hoc cooperation between the two levels of government, it would appear that agreement on flexible measures — such as a temporary reduction of the sales tax — might minimize the time required to come to an agreement. If the agreement were to cover measures involving permanent amendment of federal-provincial tax-sharing agreements or a new cost structure for programs now in force, the time required could be much greater owing to the complex interplay

of negotiations and calculations of the financial implications in the longer term (Auld, 1980).

## **Proposals for a Regionalized Stabilization Policy**

Since the Carter Report, a variety of proposals involving the federal government and the provinces have sought to give a regional dimension to the regulation of the business cycle. These proposals are based in differing degrees on the principles of regional stabilization analyzed above.

### ***Institutional Proposals for Regional Stabilization***

#### **THE CARTER REPORT AND THE ONTARIO ECONOMIC COUNCIL**

In the mid-1960s, the Carter Report proposed stabilizing provincial revenues at a full employment level so that the provinces' budgetary constraints would not accentuate the effects of a recession on the regional economy. More specifically (Vol. 2, pp. 94–96), the Report proposed that federal transfers to the provinces during troughs in the cycle offset the loss in yield on provincial income taxes in relation to revenues at full employment. In addition, the federal government would create a special fund in which the provinces would deposit all income tax receipts in excess of full employment revenues. Ottawa would encourage contributions from the provinces by paying an interest premium on deposits received.

This proposal was intended more to prevent the provinces from having perverse effects on their business cycles than to obtain their explicit participation in regulating the economy or to improve or reinforce the automatic stabilization component of Canadian government finances. However, the Carter recommendation might have had the advantage of encouraging the provinces to administer their budgets in line with the business cycle. In periods of expansion, there would have been incentives to set funds aside, and thus administer spending prudently. In a recession, federal revenue stabilization transfers and the possibility of withdrawing funds deposited during the previous expansion would have encouraged the provinces to adopt stabilizing measures. In the long run, this exercise might have required coordination by the federal government.

This proposal remains an attractive one in the eyes of Canadian analysts: it was recently reintroduced by Wilson (1977), who proposed a seven-point program for Ontario, which can be summarized as follows:

- Tabling of a provincial full-employment budget should enable the province to avoid adopting measures that are perverse for its economy.
- Ontario should support a federal-provincial agreement aimed at stabilizing provincial revenues. This is essentially a vote of support for the Carter proposal.

- In addition, however, a province should conclude agreements with the municipalities on revenue stabilization.
- A provincial discretionary policy should be formulated in conjunction with the federal government and the other provinces. The greater stability of provincial revenues would encourage provinces to be more active in stabilization; Wilson proposes that this activity be part of a plan for at least partial cooperation.
- If a province takes stabilization measures, it should choose instruments that minimize interregional leakage.

More recently, the Ontario Economic Council (1983) examined the possibility of Ontario levying its own personal income tax, as is done in Quebec. A federal government policy that is regarded as inadequate at the provincial level is amplified by the present tax structure. But a provincial tax structure in Ontario would increase the province's possibilities for discretionary intervention for stabilization purposes. The greater freedom to intervene would, however, reduce the leverage of federal government taxation. While OEC does not propose outright that the province should adopt its own tax structure, it nevertheless sees greater federal-provincial cooperation as one way to solve the present problem of the dependence of provincial taxation on federal decisions.

The OEC proposals clearly favour greater participation by the provinces in the cyclical regulation function. Furthermore, they recognize the importance of the municipalities' fiscal lever in a province. Tax agreements should promote at least a non-cyclical use of this lever. Finally, another constant in the OEC approach is that it recognizes the primacy of the federal government's role and the need for federal-provincial cooperation in implementing major stabilization measures.

The proposals by the Carter Commission and the Ontario Economic Council have not led to any amendments to the tax agreements between the federal government and the provinces. In fact, the program designed to stabilize tax payments to the provinces provides for unconditional payments to be made to provinces whose adjusted receipts (same rate and tax structure) fall absolutely from one year to the next (Government of Canada, 1979). In periods of high inflation, such as the one we have been experiencing since 1973, a very deep recession would be needed before the provincial tax "stabilization" program went into effect. Consequently, this program has little in common with the proposal that provincial revenues be stabilized at their standardized full-employment levels.

## THE REGIONAL STABILIZATION FUND

The Raynauld proposal (1971) sought essentially to alleviate the provinces' budgetary constraints in periods of recession so that they might take stabilization measures as needed.

The "regional stabilization fund" would act as a new non-profit financial intermediary issuing its own securities on the private market. Its issues would be fully guaranteed by the federal government, and yields would be lent to the provinces at interest rates equal to those paid by the federal government on its own borrowings. The amount of funding made available to the provinces would be determined on the basis of the health of the economy through a federal-provincial agreement or, in case of disagreement, by Ottawa unilaterally. Money borrowed from the fund would, of course, not be subject to the interest premium normally borne by provincial securities.

The Raynauld plan, unlike the proposals of the Carter Report or the Ontario Economic Council, does not involve new transfers from the federal government to the provinces. Its main function would be to recycle savings in Canada in accordance with the varying needs of the business cycles in the different regions. The amount to be recycled would be defined by a federal-provincial agreement. Since it is likely that the provinces would regard the amounts proposed on the basis of cyclical criteria as too small, the federal government would be required to exercise its authority to regulate access by the regions to the fund. The fund would furthermore reduce the provinces' traditional reluctance to participate in cyclical stabilization by making funding more readily available and reducing the cost to them. This proposal was formally adopted by the Bourassa regime in Quebec in the early 1970s, but it has never elicited a favourable response from the federal government.

## STABILIZATION FUND

Lacroix and Rabeau (1978, 1979b and 1981) proposed the creation of a stabilization fund that would be financed by the federal government in order to regionalize part of its stabilization policy and integrate the provinces into the stabilization function in Canada.

Their fund would both ensure regionalization of stabilization policy and enable the federal government to circumvent what analysts have called its "fiscal dilemma" in administering regulation policy. To be sure, the federal government has the financial means to carry out stabilization, and its leadership would appear essential for coordination. Yet a large component of the fiscal lever constituted by government expenditures of a flexible nature, especially Gross Fixed Capital Formation, lies in the hands of the provinces and municipalities. Since 1970, the federal government has tried, with varying success, to avoid this "dilemma" by adopting measures that raise serious constitutional problems (grants to municipalities, for example) or which are not very effective from the point of view of increasing production potential but have a tendency to increase the federal government portion of GNP (for example, so-called job creation programs).

Moreover, the federal government could provide all financing for the stabilization fund, enabling it to draw on capital spending, which represents a major fiscal lever controlled by the provinces, provincial Crown corporations and the municipalities. The amounts available would be determined each year through federal-provincial consultation on the economic outlook and on regional and national production and employment objectives. The provinces would rely on the stabilization fund mainly (but not exclusively) to finance expenditures on public infrastructures selected from a list of eligible projects, in accordance with formulas related to economic indicators and calculations of the impact of the spending on output and employment.

Each province's access to the fund would be determined by relatively easily enforced rules in order to ensure the most flexible possible intervention in the business cycle. The authors recognize that the rules of access must provide for certain adjustments to reflect, in particular, differences in the tax burdens of the provinces, as well as the legislation and regulations some provinces impose on their labour markets. For example, in controlling allocation of stabilization funding, the federal government would not subsidize one province more than the others merely because its taxes were higher than the national average and thus reduced the value of the regional multiplier. Instead, the provinces would be free to make additional contributions to the funding received from the stabilization fund, and hence to revise their objectives (e.g., for job creation) upward in the trough of a recession.

Furthermore, since the fund would possess its own spending power under the regulations set by Parliament, it would help minimize the problems created by the amount of time it takes to grasp the process of implementing stabilization measures. One effect of the fund would be to allow the provinces indirect access to the central bank, since the financing of the fund would be integrated into the federal government's budgetary transactions. But the Lacroix-Rabeau proposal does not imply that financing the fund should increase the federal government's financial burden significantly over a complete cycle, but rather that the creation of such a fund would require a restructuring of federal government expenditures. Thus, transfers to municipalities, expenditures for direct job creation and some subsidies from departments with economic mandates would disappear from the federal budget, to be replaced by transfers from the fund to the provinces. In addition, more effective management of stabilization policy, especially if it brought unemployment down in regions where it is higher than the national average, would make it possible to reduce transfers for unemployment insurance.

Lastly, in addition to a federal-provincial agreement on managing the fund over the cycle, the authors specified that there should also be consensus between the two levels of government on establishing a list of projects eligible under the fund. This general agreement would thus

cover the guidelines for medium-term economic strategy, thereby facilitating a linkage between the cyclical and economic growth aspects of economic policy. Even without an agreement, the stabilization fund could continue to operate on a cyclical basis, though it would not deliver all the benefits that the country might obtain from it in the longer term.

### *Objections to the Proposals*

The reservations about regional stabilization policy analyzed in the second section apply, *mutatis mutandi*, to all proposals for regionalizing the stabilization of the business cycle. If, as Courchene (1978) maintains, all types of federal transfers to the provinces have already seriously disrupted resource allocation mechanisms in Canada, then further recycling of resources to high-unemployment regions through federal stabilization programs could have unfavourable effects on the regions in the medium term. The goal of reducing employment rate disparities would not be achieved, and the policy might possibly widen the differentials. However, the proposals are not very precise on the subject of additional resource transfers to some of the regions involved. For example, one part of the stabilization fund transfers would simply replace other existing forms of transfer.

It should be recalled that the hypothesis that demand stimulation in regions with high unemployment will not generate a wage movement that would subsequently cancel all benefits gained in the labour market, remains the basic underlying principle for regional stabilization. For this to be the case, local conditions must be independent of the overall economic situation and wage growth. The Lacroix-Rabeau proposal does entail certain dangers in this regard. In some regions, projects financed by their fund could create pressures on the construction industry, where wages are particularly sensitive to such shocks (see Assayag and Rabeau, 1978). A rise in wages in this industry could spill over into the labour market in the region and cause a subsequent reduction in employment.

The use of capital spending for stabilization also raises the classical problem of maintaining a file of eligible projects that could be operational in a reasonable time without constituting a waste of public money. The failure of the federal government's list of projects during the 1950s (Will, 1966 and 1967) still leaves doubts as to the possibility of using such an inventory successfully. In this connection, the so-called job creation programs that the federal government and some provinces favoured during the 1970s are probably one of the quickest ways to stimulate employment.

Another more circumstantial objection to these proposals is based on the current size of the federal government's deficit. If the proposed measures helped to increase or even just prevent a reduction of the

deficit, the crowding-out effects on financial markets would tend to cancel fiscal stabilization measures. Unfortunately, there is as yet no consensus on the macroeconomic significance of the federal government deficit. Auld (1980) mentions that the empirical indicators available do not suggest that the federal government's crowding-out effects during a recession would be very significant. On the other hand, Rousseau (1983), Bruce and Purvis (1983), and Bossons and Dungan (1983) argue that, if the inflation premium is removed from interest charges on the government debt, and if revenues and expenditures are standardized to a long-term level of production and employment, the structural part of the debt will turn out to be much smaller. Moreover, part of the debt would then be circumstantial: a program to control spending when the economy improves and inflation slows down should thus enable the federal government to reduce its borrowing substantially. Others claim that it is no longer possible to eliminate inflationary expectations in the economic system and the attendant pressures on interest rates without resorting to a major restructuring of government finance that would block any use of fiscal policy for stabilization purposes.

Although the question of crowding-out effects in Canada has not yet been clarified, it is nonetheless obvious that a regional stabilization mechanism that tended to increase the federal government's deficit would not be desirable. The Carter proposal specifies a self-financing plan, since transfers granted during recessions would be offset by equivalent reductions in periods of economic growth. The Raynault proposal provides for private financing of the stabilization fund. Lacroix and Rabeau maintain that their proposal should not raise the deficit, given the flexibility of the spending involved and the accompanying reallocation of federal government finances; however, they are unable to demonstrate that the federal government deficit would not be affected by their proposal.

The Carter proposal and, to a lesser degree, the Lacroix-Rabeau proposal, would mean greater cyclical stability of the provincial budgets. In fact, in the case of the Carter proposal, complete stability could theoretically be achieved. In return, however, the cyclical elasticity of the federal budget would be increased, while excessive federal budget elasticity could cause problems for macroeconomic management of stabilization policy (Fortin, 1982a). Because of financial effects resulting from the budget's extreme sensitivity to the business cycle, the federal government might be hesitant to take the necessary measures in a recession. The problem would be to avoid a situation in which excessive federal budget feedback forced the federal government to take measures that cancelled out any favourable regional effects that might result from the creation of a stabilization fund.

Beyond this, we could also oppose a stabilization fund oriented toward financing public infrastructures on the grounds of investment

planning problems. But the chief argument against the principle of a stabilization fund continues to be political. Determining the regional amounts to be made available to the provinces would require prior agreement on employment and price stability objectives, on the economic outlook and on other technical aspects of stabilization. The federal-provincial consultation required to reach such an agreement could be laborious and create considerable tension between the provinces and Ottawa, as well as among the provinces themselves. The advantages of regional stabilization might thus be outweighed by the disadvantages arising from additional political conflicts in Canada.

### *Is the Status Quo Preferable?*

In view of the danger of new sources of political conflicts between the governments in Canada, according to Fortin (1982a), the status quo might be preferable to institutional modification of the administration of stabilization policy in Canada. Accordingly, a number of arguments could be advanced in favour of maintaining the present situation.

Arrangements for federal-provincial consultation on the economy and the budget already exist. The question of coordinating fiscal policy would have to be placed systematically on the agenda of these consultations. In periods when intervention is needed most, a consensus on appropriate measures could be found. The federal government would put forward the national objectives of intervention, while the provinces would have to examine the regional implications of stabilization.

The few experiences of the 1970s can indicate the kind of interventions that might be embarked upon, following these consultations. In 1971, the federal government offered to finance provincial and municipal infrastructures, though no stabilization fund existed at the time. Auld (1978) maintains that manipulating the provincial sales tax is an interesting technique for decentralizing stabilization policy. As an instrument it is flexible, and a federal-provincial accord on financing such a measure can be concluded quickly. Its effect on the business cycle is generally swift and quite effective. But the multiplier effect varies from one region to another depending on industrial structure, and some provinces may object to the measure (as Quebec did in 1978). One could, however, also expect other joint measures to be introduced at federal-provincial talks on the economy.

Of course, the provinces are now able to mitigate any effects produced by federal policy that they regard as incompatible with their economies. In this connection, Fortin (1982a) suggests that there is a tendency to exaggerate the effect of financial constraint on the behaviour of provincial budgets. In a recession, some provinces could resort to greater market borrowing to support demand stimulation measures.

Yet experience in recent years does not support Fortin's argument, and actually marks what seems to be a change of attitude on the part of some provinces toward stabilization. In the first half of the 1970s, Ontario in particular was enthusiastic about actively intervening to achieve stabilization, and critical of federal government policies, which it felt were too restrictive. This attitude then changed as the province, responding to financial pressures, gradually became more conservative and more concerned with the question of budget deficits. More recently, the experience of the Great Recession shows that Quebec and Ontario have begun to give greater priority to balancing their budgets. Rising interest rates induced these provinces to adopt a very conservative, if not perverse, fiscal behaviour during the recession: they actually raised their taxes considerably to limit the effect of the recession on their deficits.

Lastly, given the present trend away from government intervention in the economy in general, the creation of another government body like a stabilization fund would be opposed in many circles. The rather limited success of many government interventions in the economy and bureaucratic inefficiency surely argue in favour of the status quo.

### *Other Instructive Experiments*

The difficulties raised by European monetary integration show quite well that sharing the power to issue currency in accordance with criteria acceptable to the countries involved poses major political (and technical) problems (Commission of European Communities, 1977). The problem faced by the European Economic Community is exactly the reverse of Canada's dilemma: independent countries with their own power to issue money are trying to come to an agreement to create a common currency and integrate their stabilization policies. In a monetary union each country would become a large region and the rules of access to the common bank and criteria for circulating savings would have to be established with reference to the economic situation. No model from which Canada might take inspiration has been agreed to. In fact, it is precisely because each government wishes to keep full responsibility for stabilization within its own territory that this monetary union has not come into being.<sup>22</sup>

A stabilization fund does exist in Sweden, but it is reserved for private business and has no regional function as such (Taylor, 1982). Still, the idea behind this fund is interesting and, transposed to federal-provincial relations, it bears a resemblance to the Carter proposal. The provinces would be able to make deposits from their revenues into a federal fund during periods of economic growth. The deposits would bear interest and could be withdrawn during a recession. The federal government

would be able to supplement a withdrawal in response to cyclical conditions. The supplement would correspond to the tax savings for which the companies that now contribute to the Swedish fund are eligible and would encourage the provinces to adopt regulatory behaviour. The two levels of government would thus jointly finance measures designed to regulate the business cycle.

In the United States, the regional problems posed by the classical, macroeconomic type of stabilization were analyzed in the mid-1960s (Engerman, 1965). Studies of the cyclical behaviour of lower-level governments were also conducted (Rafuse, 1965). Although the financing of the American federation continues to interest many analysts (see, for example, Netzer, 1974 and Gramlich, 1982), no one proposes that the states be assigned any role whatsoever in stabilization, which remains a responsibility of the federal government alone.

## Conclusions

A few of the salient points brought to light by our examination of the question of regional stabilization in Canada are presented here by way of conclusion:

- The hypothesis underlying regional stabilization, i.e., that in the absence of sufficient interregional mobility, unemployment rate disparities between regions are due to deficient regional demand over the cycle, is not refuted by the existing empirical analyses.
- The hypothesis underlying regional stabilization, i.e., that in the absence of sufficient interregional mobility, unemployment rate disparities between regions are due to deficient regional demand over the cycle, is not refuted by the existing empirical analyses.
- The federal budget has generally had a stabilizing effect on the economy, but analysts agree that much of the discretionary action taken by Ottawa has been unsuitable or perverse for regions with high unemployment. Provincial budgets, especially since the 1960s when new tax sharing was introduced, have generally had a stabilizing effect on the economy. But apart from a few exceptional cases during the past decade, the provinces have not exercised their discretionary power for stabilization purposes.
- Despite transfers of tax resources to the provinces during the 1960s, the federal government's stabilization capacity has, as a rule, grown continuously in the postwar period. However, the failure of the philosophy of fine tuning (i.e., continuous regulation), which has meant less frequent use of taxation as a stabilization instrument, and the recurrent nature of a quite high proportion of federal expenditures, have complicated its stabilization task. Moreover, in view of the

constitutional role of the provinces, provincial spending constitutes a powerful, effective stabilization instrument in their hands.

- Empirical analysis of regional multipliers reveals that, in general, the technical objections brought against regional stabilization, which were predicated upon on a high level of interregional leakage, are not justified. An appropriate choice of fiscal stabilization instruments yields interregional multipliers that can be more than 80 percent of the values obtained at the national level.
- A number of models for regional stabilization have been proposed since the Carter Report. They are designed to provide the provinces easier access to savings and involve them directly in stabilizing the economic cycle. The proposals leave primary responsibility for stabilization to the federal government and call upon it to coordinate regional stabilization policies. However, these proposals could give rise to political conflicts between the two levels of government, and consequently ad hoc federal-provincial cooperation in regulatory matters may be preferable to any of these regional stabilization models.
- Lastly, a number of objections can be made to regional stabilization in Canada. Transfers from the federal government to the regions may already have diminished the efficiency of the resource allocation process. This situation could be exacerbated by transfers in the context of a regional stabilization policy. Since a high proportion of unemployment rate disparities can be attributed to factors other than deficient regional demand, it would be better to concentrate stabilization efforts on the efficiency of labour markets, manpower mobility, or productivity in regions with high unemployment.

## *Notes*

This study is a translation of the original French-language text which was completed in August 1984.

1. Auld (1980, p. 98) has recently given this proposal more articulate treatment, indicating hypotheses that should be adopted when assuming that stabilization policy in Canada does not have to take regional disparities into consideration.
2. The economic indicator generally used in analyses of regional cycles is the unemployment rate. Lack of quarterly data on regional production has led some analysts to use the unemployment rate as a variable in technical studies. The unemployment rate also constitutes the most important aspect of the problem for stabilization policy (Lacroix and Rabeau, 1981, p. 116).
3. In an economy with perfect labour mobility, perfect wage flexibility and no unemployment insurance benefits, there would not necessarily be an equalization of regional unemployment rates. Technology and tastes also play an important part (see Hall, 1970 and 1979).
4. The result is uncertain since more generous unemployment insurance benefits could also cause a drop in the wage level at which workers are prepared to accept a job (see Fortin, 1984).
5. By this we mean the difference between the unemployment rate in Quebec and the Atlantic Provinces on the one hand, and the Ontario rate on the other.

6. Measures aimed at reducing the cost of capital formation would not change the volume of investments, but they would alter the temporal profile (McFetridge and May, 1976).
7. In particular, see the detailed examination in chap. 2 of Lacroix and Rabeau (1981) of the history of government finance for each level of government in Canada in the postwar period. The study by Fortin (1982<sup>b</sup>) completes the historical picture.
8. Ottawa's fiscal performance is to a great extent the result of the anti-inflation campaign begun in 1969; it may also be justified by national criteria, such as ability to compete internationally. In real terms, the federal government's fiscal behaviour has been especially unsuitable for regions such as the Atlantic Provinces and Quebec.
9. In this connection, several more specific empirical studies of the federal government's regulatory role come to the conclusion that Ottawa's fiscal policy has often been inadequate (i.e., stabilizing, but insufficient in scope) and, on a few occasions, perverse (i.e., a deleterious policy in terms of the needs of the economy) (Gillespie, 1979). In the opinion of this author, who has synthesized a number of studies, the balance sheet of the federal government's fiscal performance for the 1945–75 period is, in general, quite negative. This appraisal implies that the policy of regulating the business cycle must often have been inappropriate or perverse for regions in Canada with high unemployment rates.
10. For the regional case, there are a few studies that analyze the fiscal performance of a provincial government in relation to local cyclical conditions. For Ontario, the province's fiscal behaviour between 1960 and 1967 appears not to have been "structurally" perverse (Auld, 1975). In addition, Auld shows that the provincial government can exert a stabilizing influence on its region when, from the province's point of view, federal government policy does not have the correct orientation. For Quebec, Rabeau (1970 and 1976) finds no systematically perverse fiscal behaviour by the provincial government; however, cases have been noted in which the Quebec government's fiscal activity not only was not correctly oriented, but also *amplified* the destabilizing effect of federal policy. This was the case in 1969 in particular, when the federal government brought strong moral suasion to bear on the provinces to ensure they would not compromise its fight against inflation.
11. For a recent study of this question, see Dolde (1979), Blinder (1981) and Auld (1980).
12. The Ontario government is a case in point. In 1975, it took major discretionary measures (a housing assistance program, a temporary general decrease of the sales tax, and temporary removal of the tax on cars) to minimize the effects of the recession on its local economy.
13. The tax rate, after the effect of the transfer rate is deducted.
14. In this connection, if the provinces were to behave more like the private sector, the leverage of federal government fiscal measures could be increased. If this were the case, however, the stability of the Canadian economy would be reduced by the transfer of taxes and spending responsibility to governments at lower levels. The federal government would then have to rely on discretionary measures more frequently and to a greater degree (see Wilson, 1980). Moreover, if the provinces increased their taxes when Ottawa lowered its taxes for stabilization purposes, the federal government's leverage could be reduced drastically. This would force the federal government to rely exclusively on expenditures as a stabilization instrument.
15. The input-output models and the one constructed by Miller tend to overestimate regional multipliers somewhat, insofar as they assume that the marginal propensity to import services is zero. However, Miller and Wallace (1982) have checked the sensitivity of the findings to a significant change in a province's marginal propensity to import. They found that the results were not sensitive to a variation in propensities, and consequently the essential conclusions as to the size of direct multipliers are not affected. Furthermore, estimates of direct and cross multipliers using input-output tables, or in conjunction with a model like Metzler's, do not take into account feedback on spending from the finance sector.
16. Now that they are more concerned with stabilization, the provinces have clearly become aware that they allow the federal government to reduce its deficit when they take measures to stimulate their economies.

17. On the regional effect of federal fiscal policy, see Economic Council of Canada (1977, pp. 114–16).
18. The regional effect of monetary policy is not as well understood as its macroeconomic effect (Economic Council of Canada, 1977). The dose of fiscal policy should thus vary from region to region, depending on the impact of monetary policy.
19. In the short term, “efficiency” is defined here as the greatest impact on production and employment for the least cost to the treasury, leaving aside problems of uncertainty at this stage.
20. In the simple case, ignoring problems of uncertainty and adaptation time, it can be shown (Rabeau, 1971) that a solution will generally exist if leakage between regions is not high, which, as we have seen, is the case.
21. It must be emphasized that in cases of ad hoc cooperation, Quebec has distinguished itself from the other provinces by setting up a provincial anti-inflation commission and reducing its sales tax only selectively. This simply illustrates the difficulties of securing federal-provincial cooperation on economic policy in Canada.
22. Furthermore, most European countries have government programs to assist economically weak regions. These measures are similar to the programs administered by DREE to promote growth and development.

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# Monetary Control in Canada

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## Introduction

The end result is widespread rhetorical agreement by central banks around the world to what has come to be called a monetarist policy.

(Milton Friedman, 1982, p. 101)

The proper conduct of monetary policy is now once again wide open to discussion.

(James Tobin, 1983, p. 506)

In the 1970s, the principles of monetarism were adopted by many, if not most, central bankers of the Western world in order to combat inflation. More recently, with the serious recession of the early 1980s, which is sometimes even called a “depression” (Tobin, 1983), monetarism seems to have lost some of its influence. Further, a series of institutional and technological changes took place at the same time, destabilizing velocity and obscuring the role of some, if not all, monetary aggregates.

Events in Canada stand as a typical example of this phenomenon. In September 1975, the Bank of Canada officially adhered to monetarism by adopting a policy of gradual decrease in the rate of growth of M1 (Bouey, 1975).<sup>1</sup> But, despite its repeated claim of having strictly followed its policy, the Bank of Canada did not succeed until recently in reducing inflation. Indeed, the Bank has been the object of widespread criticism from both the converts to and critics of monetarism. Monetarists claimed that the Bank did not really follow the precepts of monetarism (Courchene, 1981a, 1981b) or implemented the policy too gradually (Wirick, 1981); hence the failure to bring down inflation. Several non-monetarists blamed all the evils that were plaguing the Canadian economy at the end of the 1970s and the deep recession of the early 1980s on

monetarism as applied by the Bank of Canada (Donner and Peters, 1979; Peters and Donner, 1981; Barber and McCallum, 1980, 1981, 1982; McCallum, 1983).

In November 1982 the Bank of Canada officially abandoned M1 as its policy target. This decision was justified by important technological and financial innovations that meant that the Bank could not rely any more on the behaviour of M1 for the conduct of its policy.<sup>2</sup>

Governor Bouey insisted at the same time on the fact that "success in bringing inflation down is essential if we are to get out of these difficulties" (Bouey, 1982, p. 9). The Bank has not yet adopted a new monetary target; nor has it specified its policy stance in precise terms, though Courchene (1983a) interprets it as a policy of controlling the exchange rate.

Bearing this in mind, we examine monetary control in Canada through a review of the literature. We try to clarify the problems related to monetary control and identify the topics or areas that have been overlooked in the Canadian literature. The principal question we are trying to answer is: Assuming that the monetary authority must exercise control over the size of the money stock (monetary targeting), how should this control be exercised? This question covers the choice of instruments and the intermediate and ultimate targets, as well as the tactics of monetary policy (for example, rules versus discretion, gradualism versus cold shower).

We then present an overview of the problems of monetary control. After summarizing the institutional background, we describe a simple model of monetary policy and distinguish between instruments of monetary policy, intermediate targets and ultimate targets. We continue by discussing the choice of an ultimate target and the choice of intermediate targets. In the former case, we stress that the choice of an ultimate target depends heavily on the time horizon considered. In the latter case, we examine two bodies of literature that provide justifications for using monetary targets but, nevertheless, lead to very different strategies: the "targets-and-instruments" literature, and the "rules-versus-discretion" literature.

We follow this with a discussion of more specific problems associated with monetary targeting in Canada. We first present the position adopted by the Bank of Canada on monetary targeting; then we review the discussions on the choice of a control instrument between the monetary base or some interest rate and the selection of the appropriate monetary aggregate to be used as intermediate target.

We then review the empirical evidence that can shed light on various aspects of the debate over monetary control: empirical studies on monetary control and monetary multipliers; empirical studies of demand for various monetary aggregates (values of elasticities, fit, stability, etc.); reduced-form studies of the relationship between money and inflation,

money and nominal income, money and real variables. Most of the studies are based on Canadian data, but we also relate the issues raised in the debate over monetary control in Canada to discussions outside Canada and especially in the United States, and point out a number of gaps in the Canadian literature. Finally, we summarize the paper and present our recommendations.

## **Overview of the Problems of Monetary Control**

Monetary policy involves the manipulation of one or several instruments by a central bank in order to influence the behaviour of certain goal variables. This is often described as a two-step procedure in which an instrument is used to influence an intermediate target, which in turn affects the goal variables.

Here we discuss in general terms the process of monetary policy. After a brief review of the institutional background, we define the basic elements of the process. Then we discuss the selection of an ultimate target and the problems associated with it. Finally, we examine the rationale behind the use of intermediate targets and the concept of a monetary rule. The selection of an instrument will be discussed under Monetary Targeting.

### ***Institutional Background***

In our institutional framework, the Bank of Canada has a monopoly over the supply of so-called “base money” or “high-powered money.” Base money is the sum of currency outside the banking system and reserves of the banking system (vault cash and deposits at the Bank of Canada). Base money is the basic instrument over which the Bank has control and through which it has an impact on the economy. Currency provides the means for cash transactions outside the banking system, while reserves support, and limit, the supply of credit by the banking system. Since the banks need to keep reserves equal to only a small fraction of their deposits, a given amount of reserves has enormous leverage (of the order of 20). The multiplicative factor is limited by the necessity of facing withdrawal demands and by required reserve regulations.

In practice the reserve regulations constitute the dominant factor. The level of necessary reserves depends on whether the deposits are short-term or long-term. Clearly, short-term deposits — for example, demand deposits and company current accounts — require more reserves than long-term deposits — such as savings deposits and term deposits.<sup>3</sup> According to the Bank Act, required reserves are computed on the basis of a two-week cycle. Over a given two-week period, a commercial bank must maintain average reserves that exceed the required minimum. The latter depends on the average level of deposits of the four Wednesdays

ending with the second Wednesday of the previous month. This feature is called "lagged-reserve" accounting. The main alternative to this system is "contemporaneous-reserve" accounting, where required reserves depend on current deposits.

Measures of the money supply are obtained by adding various types of deposits to currency outside commercial banks. For example, M1 is the sum of currency and demand deposits; that is, assets used for transactions purposes. To obtain M2, personal savings deposits and notice deposits of firms are added to M1. We present a list of the various aggregates in Table 5-1. M1, M1A, M1B, and the monetary base can be classified as narrow aggregates, while the others are broad aggregates.<sup>4</sup>

Adopting a procedure of monetary control and, more generally, adopting a monetary policy amount in the end to selecting a trajectory of the monetary base or some feedback rule on the monetary base. For example, if the Bank wishes to fix an interest rate it must do so by increasing or decreasing the reserves available to the banking system or, more directly, by pegging the price of the appropriate class of securities. If it wants to stabilize the level of the exchange rate, the Bank must trade foreign currency for domestic currency or vice versa. All these operations involve changing the amount of high-powered money in the economy.<sup>5</sup>

The Bank of Canada manages the funds of the Government of Canada, which it can hold itself or deposit in commercial banks. In day-to-day operations, an important instrument of the Bank of Canada is its ability to shift government deposits between commercial banks and itself. In this manner, it can influence the level of reserves (or excess reserves) available to commercial banks and exercise pressure on interest rates, since reducing the level of government deposits in commercial banks reduces the level of reserves available and vice versa. Since there is a one-to-one correspondence between changes in reserves and changes in the monetary base, this is equivalent to fixing the level of the base. Bank reserves may also be increased if commercial banks borrow from the Bank of Canada at the discount rate (the "discount window"), which has also a direct effect on the monetary base. Such borrowings, however, play a negligible role in Canada.

This description of the process of monetary creation is sufficient for our discussion. Other details on the main definitions and the institutional background that are important in an analysis of monetary control may be found in Binhammer (1982); Bond and Shearer (1972); Boreham et al. (1979); Botha (1972); Cairns and Binhammer (1965); Courchene (1975, 1981b, 1983a); Dingle, Sparks, and Walker (1972); Neufeld (1972); Shearer (1977); White and Poloz (1980); and various issues of the *Bank of Canada Review* (especially the March 1983 issue on monetary aggregates).

**TABLE 5-1 Some Definitions of Money in Canada**

	December 1983 Millions of \$
1. Currency outside banks	12,401
2. Demand deposits (less private sector float)	17,824
2.1 Gross demand deposits	18,727
2.1.1 Personal chequing (gross)	3,438
2.1.2 Other	15,289
2.2 Estimated net private sector float	903
3. Personal savings deposits	100,646
3.1 Personal savings deposits: Chequable	8,724
3.1.1 Daily interest	3,373
3.1.2 Other	5,351
3.2 Personal savings deposits: Non-chequable	50,862
3.2.1 Daily interest	10,950
3.2.2 Other	39,912
3.3 Fixed-term personal savings deposits	41,061
4. Non-personal term and notice deposits	43,737
4.1 Notice deposits, chequable	2,296
4.2 Notice deposits, non-chequable	3,402
4.3 Bearer term notes	5,475
4.4 Other fixed term deposits	32,564
Foreign currency business with Canadian residents (booked in Canada)	9,785
5. Government of Canada deposits	6,480
7. Some possible definitions	
a) $M1 = 1 + 2$	30,225
b) $M1A = 1 + 2 + 3.1.1 + 4.1 + 4.2$	39,296
c) $M1B = 1 + 2 + 3.1 + 4.1$	41,245
d) $M2A = 1 + 2 + 3.1 + 3.2 + 4.1 + 4.2$	95,509
e) $M2B = 1 + 2 + 3$	130,871
f) $M2 = 1 + 2 + 3 + 4.1 + 4.2$	136,569
g) $M2C = 1 + 2 + 3 + 4$	174,608
h) $M3 = 1 + 2 + 3 + 4 + 5$	184,393
i) $M4 = 1 + 2 + 3 + 4 + 6$	181,088

Source: Bank of Canada Review (August 1985).

Note: M1, M1A, M1B, M2, M2C, and M3 correspond to the concepts that are (or were) published by the Bank of Canada. M2A, M2B and M4 are other concepts found in the literature.

*A Simple Representation of the Process*

A convenient way of presenting the process of monetary policy is to consider the classic “quantity equation”:

$$Py = MV, \tag{1}$$

where  $P$  is the level of prices,  $y$  is real income,  $M$  is some monetary aggregate, and  $V$  is the income velocity of the aggregate considered. This equation is in fact an identity, which states that the value of nominal income ( $Y = Py$ ) is identical to the quantity of money in the economy multiplied by the number of times each unit of money turns over. The banking system creates money from the high-powered money directly issued by the Bank. This relationship can be described by a "multiplier equation":

$$M = hB, \quad (2)$$

where  $B$  is the monetary base and  $h$  is the money multiplier. Equation 2 actually defines the money multiplier. If we substitute equation 2 into equation 1, we get the extended quantity equation:

$$Py = hVB. \quad (3)$$

In our institutional framework, the only variable that is under the direct control of the Bank of Canada is the monetary base. It is generally agreed that neither real income ( $y$ ) nor the price level ( $P$ ) is under the control of the Bank. The velocity of money is an inverted money demand: if the demand for money is given by the standard function

$$\frac{M}{P} = m(r, y), \quad (4)$$

where  $r$  is the rate of interest or vector of interest rates, we can write velocity as

$$V = \frac{Y}{M} = \frac{y}{m(r, y)}. \quad (5)$$

We see that  $V$  depends on  $y$  and  $r$ . It is not directly controllable by the Bank. The money multiplier  $h$  depends on required reserve regulations and certain characteristics of money demand (preferences of the public for allocating their financial assets between currency, demand deposits, etc.). The required reserve ratios are fixed by the Bank Act, which is revised in Canada about once every ten years, so that for all practical purposes, the reserve ratios are not a policy instrument of the Bank. Thus, the money multiplier is better viewed as an endogenous variable that depends on interest rates and income.

Monetary policy involves the use of certain instruments to attain economic goals, possibly with the setting of intermediate targets. Variables frequently cited as possible ultimate targets include: the price level ( $P$ ), real income ( $y$ ), nominal income ( $Py$ ), or variables closely related to these, such as unemployment, welfare, or economic efficiency. The

ultimate target is often formulated as a rate of change: inflation, the growth rate of real income, etc. Many of these objectives may be viewed as important but clearly, objectives for different variables are not necessarily compatible. One objective must be selected or some weighting of objectives adopted.

Two variables are typically considered to be the instruments of monetary policy: the monetary base, and interest rates. As we saw, the only variable under the direct control of the Bank is the monetary base. Using an interest rate as instrument is a process by which the Bank stands ready to buy and sell any amount of a specific group of securities at the price corresponding to the rate desired. These securities consist especially of government securities and government deposits in commercial banks; in particular, changes in government deposits first affect bank reserves, which in turn have an impact on the supply of bank credit. It is then assumed that the interest rate set for a group of securities will have spillover effects on the other financial markets. Of course, this pegging of the interest rate by the Bank has direct effects on the monetary base.

Variables that have been proposed as intermediate targets include: monetary or credit aggregates, interest rates, the exchange rate, and nominal income. According to Brunner (1969, p. 2), intermediate targets respond to “the problem of choosing an optimal strategy or strategies to guide monetary policy under the conditions of uncertainty and lags in the receipt of information about the more remote goals of policy.” The economic structure — and especially the transmission mechanism between the instruments of monetary policy and the ultimate targets — is uncertain. There are informational and structural lags in the process. An intermediate target should be linked with both the instruments and the ultimate target of policy, since it is more controllable than the ultimate target and conveys information about the behaviour of the ultimate target before the latter is affected or observed. Here we discuss in greater detail the goals of monetary policy and the use of intermediate targets.

### *Ultimate Targets of Monetary Policy*

The choice of an ultimate target depends heavily on whether the long-run or the short-run is considered. Most economists would agree that in the long-run, money mainly affects nominal variables such as the level of prices, rather than real variables such as income or unemployment. Thus, in the long-run, the only viable ultimate target is the level of prices or the rate of inflation. But economists often disagree about the desirable rate of inflation and the appropriate variability of this rate, though they generally prefer a low and not too variable inflation rate.

In the short-run, money can affect both nominal and real variables. Potential candidates for short-term targets, such as price stability, unem-

ployment, and the growth rates of real or nominal income, are more numerous than those for long-term targets. Frequently, formal models of the choice of a monetary instrument consider that the ultimate goal variable is to minimize the variance of real income about its potential level (see Fortin, 1979; Friedman, 1975; Sparks, 1979).

Three important problems are associated with the choice of an ultimate target for monetary policy. First, one must choose the speed at which monetary policy should try to reach the ultimate target. Should the policy be gradual or follow a cold-shower approach? For example, in 1975 the Bank of Canada chose to reduce the rate of growth of a monetary aggregate gradually with the purpose of bringing down inflation gradually (Bouey, 1975). Later the Bank concluded that monetary deceleration was probably too gradual from 1975 to 1978 (*Annual Report, 1980*, p. 12). Wirick (1981) and Courchene (1981a, 1981b, 1983a, 1983b) also expressed their preference for a cold-shower approach. Inflation in Canada finally began to fall at the beginning of the 1980s when the Bank adopted a more restrictive policy.

Second, one must take into account the openness of the economy. In an open economy, an exchange rate regime must be adopted. If the exchange rate is flexible, the monetary authority is free, in principle, to assign any goal deemed appropriate to monetary policy. If the exchange rate is fixed or managed within a narrow band, the monetary authority loses its independence in choosing internal objectives for monetary policy. Monetary instruments must be used to fix the exchange rate and the leverage of monetary policy over internal objectives becomes very limited. Important variables, such as the rate of inflation, are largely determined by policies in other countries. Under such circumstances, the stabilization of the exchange rate is a binding intermediate target: one believes that other goals — such as the control of inflation or the growth of real income — are best achieved by keeping the exchange rate fixed.

Third, one must adopt a way to conduct monetary policy in terms of the objective adopted. Should the monetary authority follow a pre-announced rule or should it adopt a discretionary policy in view of the ultimate target? This issue is controversial, but is also important in the context of adopting an intermediate target.

### *Intermediate Targets*

According to Benjamin Friedman (1975, p. 456), “the intermediate target problem is the choice of a variable, usually a readily observable financial market price or quantity, which the Central Bank will treat, for purposes of short-run operating guide, as if it were the true ultimate target of monetary policy.” This problem arises when there is uncertainty about the structure of the economy and lags between the manipulation of instruments and the observed effects on the ultimate targets.

Variables frequently suggested as intermediate targets include especially interest rates, monetary aggregates, and in an open economy, the exchange rate. Some also believe that nominal income may be used as an intermediate target.

The use of monetary aggregates as intermediate targets can be based on two different rationales whose implications differ markedly. On the one hand, the “target-and-instruments” literature recommends using monetary aggregates as a source of information about the economy but does not provide a basis for a strict monetary target. On the other hand, the “rules-versus-discretion” literature provides a basis for a strict adherence to a monetary target. We now examine these arguments.<sup>6</sup>

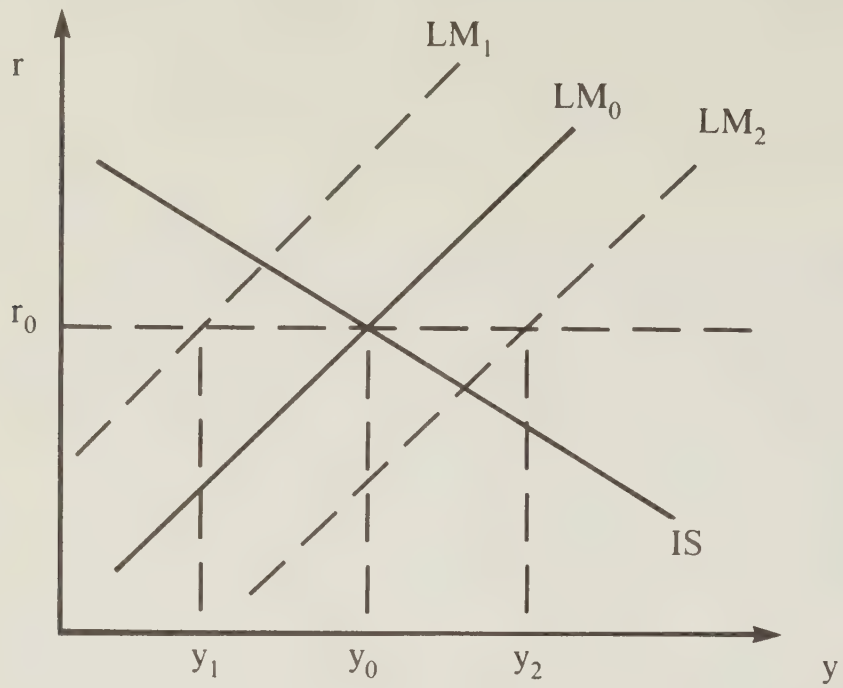
The debate over intermediate targets for monetary policy largely originates in the monetarists versus Keynesians debate. Monetarists argue that money has important effects on the economy, though the size and timing of these effects may be difficult to predict. As a result, the money stock is a variable the monetary authority should monitor closely, and useless fluctuations should be avoided. Stabilization policies that do not control the growth of money may easily destabilize the economy. Keynesians associated with the so-called “New-View” argue that money is only one of many financial instruments that can be distinguished from other assets because of regulations imposed on the banking system (Tobin, 1963). Thus the conditions not only of money but also of credit in general must be considered, and monetary policy must be conducted with a view to interest rates. This debate suggests two types of variables as possible intermediate targets for monetary policy: money and interest rates.

Poole (1970) played a key role in discussions in the literature that deals with the problem of selecting the appropriate intermediate target. Using a simple stochastic *IS/LM* model, Poole studied whether the appropriate method of minimizing the variance of real income is to fix interest rates or the stock of money. The conclusion depends on the values of the coefficients in the model. However, an important result is that interest rate control is preferable when shocks to the demand for money (shocks to the LM curve) are the main source of perturbation, while money stock control is preferable when the main source is the real side of the economy (shocks to the IS curve); see Figure 5-1. Further, a mixed intermediate target (a linear combination of money and the interest rate) is generally preferable.

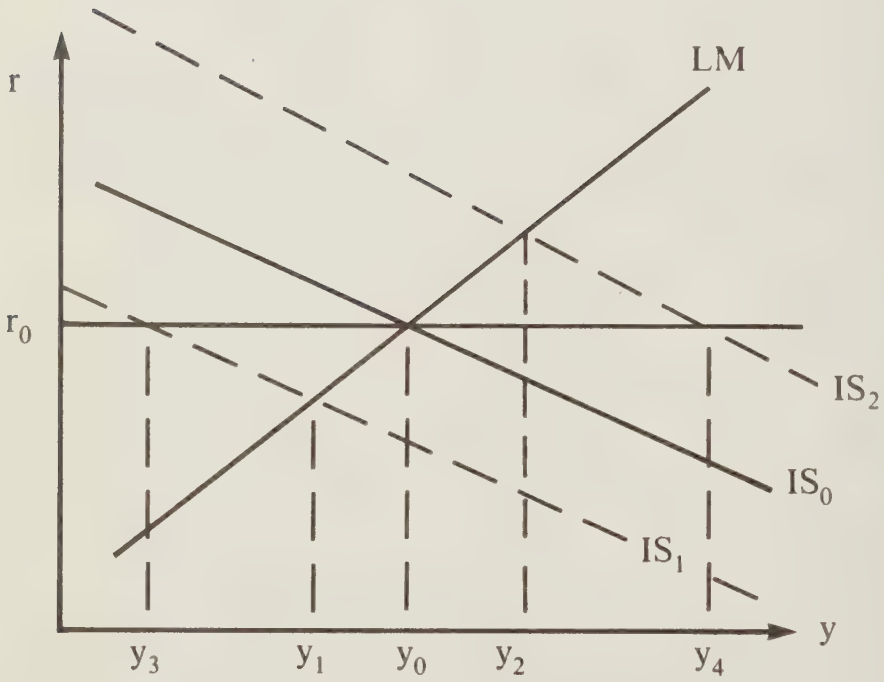
Poole’s model was extended in several directions. Some authors considered uncertainty not only on the IS and LM intercepts but also on the whole structure of the model (Kareken, 1970). Other authors used dynamic versions of the model with uncertainty on the structure (Sargent, 1971; Turnovsky, 1975). Finally, this type of analysis was extended to the case of an open economy, which introduces the exchange rate as a possible intermediate target (Boyer, 1978, 1979; Sparks, 1979).

The latter case is, of course, especially important for Canada, but the

**FIGURE 5-1 Diagrammatic Representation of Poole's Analysis**



a. Shocks to the demand for money ( $LM_0$  to  $LM_1$ ,  $LM_0$  to  $LM_2$ ). Under money stock control,  $y$  varies between  $y_1$  and  $y_2$ . Under interest rate control,  $y$  stays at  $y_0$ .



b. Shocks to the real side ( $IS_0$  to  $IS_1$ ,  $IS_0$  to  $IS_2$ ). Under money stock control,  $y$  varies between  $y_1$  and  $y_2$ . Under interest rate control,  $y$  varies between  $y_3$  and  $y_4$ .

results, in general, are so complicated that they are difficult to interpret for policy purposes. On this problem, Freedman (1982, p. 115) notes: "From the point of view of a small open economy such as Canada, the policy literature developed thus far has not been overly helpful." He argues, however, that central banks generally have more information than assumed by these theoretical models, especially on the sources of the shocks. Moreover, many possible variations of the assumptions in these models (e.g., about substitutability between domestic and foreign securities or goods, the relative flexibility of prices, the nature of expectations, and the objective function) lead to divergent conclusions. In general, nevertheless, we can say that authors who considered the case of an open economy concluded that the optimal intermediate target is a combination of the money stock, the interest rate, and the exchange rate rather than a unique intermediate target.

Some authors have rejected the notion of a single intermediate target altogether (Bryant, 1983a, 1983b; B. Friedman, 1975); others reject money as the appropriate intermediate target (Bean, 1983; Gordon, 1983a, 1983b). The former consider that the conditions under which a single intermediate target would be optimal are too restrictive to be met in practice. They believe there is no reason why a central bank should use only the information contained in a single target when much more information on the structure of the economy is available. Alternatively, Gordon and Bean consider that monetary targeting puts too much emphasis on the means as opposed to the goals of the policy. Besides, they view the money multiplier ( $h$ ) and velocity ( $V$ ) as too volatile for money to be a useful target. Instead, they recommend using nominal income as the intermediate target. We will discuss this option later.

To sum up, the literature on "targets and instruments" considers that monetary aggregates simply constitute indicators that provide information about the final targets of monetary policy. The optimal policy is one in which the central bank looks at everything deemed relevant. It does not provide a basis for pursuing a rigid rate of growth of any particular monetary aggregate.

Turning now to the "rules-versus-discretion" literature, we find that the basic role of monetary policy is to fix the general level of prices. Such a policy defines a monetary unit that is a good basis on which economic agents can make their decisions. Further, the adoption of a monetary rule (a fixed rate of growth of some monetary aggregate) is proposed to exclude discretionary actions to stabilize the economy. Such attempts are considered to be either destabilizing or a dangerous encroachment by the state on private markets. The rule provides information to economic agents on the intentions of the monetary authority and thus limits the amount of "noise" originating from it. Consequently, it is important that the rule be followed in a relatively strict way; indeed, this is a condition for the "credibility" of the policy. Further, the rule should be

formulated in terms of a monetary aggregate as opposed to an interest rate, because in the latter case the price level may be indeterminate (see McCallum, 1981; Sargent and Wallace, 1975; Wicksell, 1906).

But what are, more precisely, the arguments for a monetary rule? A first set of reasons comes from various pitfalls in the implementation of stabilization policies: long and variable lags in the effects of policies (M. Friedman, 1953), uncertainty about the structure of the economy (Brainard, 1967), and nonlinearity of the macroeconomic structure (Shupp, 1972). But these difficulties justify a careful use of discretionary policies; they do not necessarily lead to the adoption of fixed rules.

A second and more compelling argument goes back to Simons (1936), who contended that permitting the central bank to stabilize the economy gives too much power to the state in a market economy. Activism encourages the state to increase its role in the economy and undermines the foundation of a market economy. Further, the absence of a rule means that the central bank is much more exposed to political pressures; and that there is no guarantee that such pressures lead to an “optimal monetary policy.” Discretion adds “political noise” in the economy.<sup>7</sup>

A third line of argument comes from the rational expectations literature (see Barro, 1976; Lucas, 1972; Lucas and Sargent, 1981; Sargent and Wallace, 1975). The rational expectations hypothesis is that economic agents efficiently use all the information available to them in order to form expectations on the variables relevant to them, including policy variables. Under certain conditions, this implies that only unanticipated monetary changes have an effect on the economy. Further, the use of policies that are totally or partly unanticipated can only destabilize the economy. This, of course, suggests that the government follows pre-announced policy rules, the simplest one for monetary policy being a constant growth rule of some specified monetary aggregate.

An important implication of this point of view is the so-called “Lucas critique” (Lucas, 1976). In this argument, parameters of econometric models reflect the optimal decision rules of economic agents. If the latter are rational, we can expect that the stochastic characteristics of policies will enter into these decisions. As a result, when policies are changed, we can expect that parameters will change. Results of econometric studies based on data from a different policy regime may not be reliable guides to what will happen when policy is changed in a fundamental way. In other words, policy is viewed as a game between two players instead of a game against nature, and the policy maker must take into account the fact that economic agents try to predict his actions and adjust optimally to them. This critique undermines the validity of many optimal control exercises in the “targets-and-instruments” literature.<sup>8</sup>

To sum up, the adoption of a monetary rule, as opposed to a discretionary policy, can be justified on at least two grounds: first, it can be a way of reducing “political noise” in the economy; second, under the assump-

tion of rational expectations, it can be an optimal policy in the sense that it will minimize the variability of real income around its “natural level” as well as the variability of inflation.

Whether the assumptions that lead to these conclusions are met in practice is an empirical question. It has been and remains a very active research area. We have no place to summarize this work here. We note, however, that many implications of the rational-expectations models hold under alternative assumptions. For example, difficulties analogous to those suggested by the Lucas critique can occur whenever economic agents adjust their behaviour to the stochastic characteristics of policies; all that is needed is some form of adjustment of expectation formation when policy regimes change, not necessarily the “rationality” of expectations (though, of course, one has to specify an alternative mechanism of expectation formation). Similarly, even in the absence of rational expectations, establishing the “credibility” of policy announcements may call for the adoption of a monetary rule. Fellner (1976), for example, argues that prices are sluggish because economic agents have been led to expect policies will be reversed quickly. In his view, only the adoption of a “credible” policy (for example, a monetary rule that is sustained for a long period) can restore the confidence of economic agents and thus price flexibility.

The debate about money as an intermediate target thus amounts largely to the debate about policy activism. Authors who favour strong monetary targeting usually also favour a monetary rule and would like to see a relatively strict adherence to a target. In Canada, Courchene (numerous writings), Howitt and Laidler (1979), Parkin (1983), and Wirick (1981) can be identified with this theme. By contrast, policy activists prefer to leave more room for discretion of varying degrees in the conduct of monetary policy (see Fortin, 1979, 1982a, 1982b, 1983; and McCallum, 1983). No rigid targeting is favoured, even though some believe that the rate of growth of the money supply should be brought down. We think also that the Bank of Canada has been leaning more in this second direction than in the first, although there may be disagreement on this interpretation. In any case, positions can largely be interpreted in terms of the degree of adherence to a pre-announced target.

## Monetary Targeting

A policy of monetary targeting consists of adopting a target rate of growth for a selected monetary aggregate over some period. Usually a band rather than a single target is adopted. From technical considerations, the simplest and most easily attainable policy would consist of fixing a target in terms of the monetary base. Monetary targeting, however, is usually defined in terms of broader aggregates whose economic role (e.g., transactions, saving) is easier to identify: M1, M2, etc.

This involves selecting a trajectory of the monetary base such that the desired value of  $M = hB$  is attained (see equation (2), above). If  $h$  is constant, the monetary authority can find easily the change in  $B$  required to produce the change in the desired  $M$ . There is, however, a practical difficulty because  $h$  is not constant.

Here we take the view that some form of monetary targeting is necessary and discuss more specific issues associated with this policy by reviewing especially the recent literature on this topic in Canada. We first consider the relatively theoretical or policy-oriented works, and then we examine the empirical evidence. But before going into a discussion of the problems associated with a policy of monetary targeting, it is useful to summarize the basic position taken by the Bank of Canada on that issue in recent years.

### *Bank of Canada Position on Monetary Control*

In 1975, the Bank of Canada recognized that reducing inflation required reducing the rate of monetary expansion. Following a movement that was taking place in the United States and other countries (Sumner, 1980), the Bank announced it would use a monetary target as guideline for policy in the future. This involved three types of choices:

- selection of a monetary aggregate to control;
- selection of a method of control;
- selection of a target growth rate.

Simplifying considerably, we can state that the Bank expressed the following preferences. First, it chose to adopt only one monetary target, in contrast with the United States, which formulated targets in terms of several aggregates. Second, it chose to control a narrow aggregate (M1) instead of a broad aggregate (for example, M2). Third, the instrument of control selected was the short-run interest rate instead of the monetary base. Fourth, the Bank's objective was to attain the pre-announced target plus or minus two percentage points, making the effective target a band of four percentage points. Fifth, the Bank chose to reduce gradually the growth rate of M1, instead of using a cold-shower policy.

Over the 1975–82 period, the Bank of Canada gradually lowered the target range. Six different bands were used: 10–14 percent (November 1975), 8–12 (August 1976), 7–11 (October 1977), 6–10 (September 1978), 5–9 (December 1979), 4–8 (February 1981). In November 1982 the Bank ceased to specify a target for the growth of the monetary aggregate M1 on the ground that it was no longer a reliable guide for policy. Details on the official policies of the Bank of Canada may be found in the Annual Reports of the Bank and various issues of the *Bank of Canada Review*. An extensive analysis of these documents is also available in Courchene (1975, 1976, 1977, 1981b, 1983a); see also Freedman (1981b); Freeman (1978, 1981a, 1981b); and Thiessen (1982).

## Selection of a Control Instrument

The two main instruments proposed for the control of monetary aggregates are the monetary base and the interest rate. We call "base control" of a monetary aggregate the procedure that consists of deciding the required change in the monetary base  $B$  on the basis of a forecast of the multiplier  $h$ .

In order to understand better how monetary multipliers are determined, let us suppose that chartered banks offer only two types of deposits: demand deposits ( $DD$ ), and time (or savings) deposits ( $TD$ ). We consider two monetary aggregates: a narrow aggregate ( $MN$ ), and a wide aggregate ( $MW$ ), defined as

$$MN = C + DD, \quad (6)$$

$$MW = C + DD + TD, \quad (7)$$

where  $C$  is the amount of currency outside the banking system. Banks are required to hold reserves against demand and time deposits, possibly according to different ratios. Total reserves held by banks ( $R$ ) can be split into required reserves against demand deposits ( $RR_D$ ), required reserves against time deposits ( $RR_T$ ), and excess reserves ( $ER$ ):

$$R = RR_D + RR_T + ER. \quad (8)$$

Further, the monetary base ( $B$ ) is the sum of currency outside the banking system and total reserves:

$$B = C + R = C + RR_D + RR_T + ER. \quad (9)$$

After some algebra, we see that the multipliers for the aggregates  $MN$  and  $MW$  can be expressed as

$$h_1 \equiv \frac{MN}{B} = \frac{m_C + m_D}{m_C + k_D m_D + k_T m_T + (m_D + m_T) e} \quad (10)$$

and

$$h_2 \equiv \frac{MW}{B} = \frac{1}{m_C + k_D m_D + k_T m_T + (m_D + m_T) e}, \quad (11)$$

where

$$m_C = C/MW, m_D = DD/MW, m_T = TD/MW, \quad (12)$$

$$e = ER/(DD + TD),$$

$$k_D = RR_D/DD, k_T = RR_T/TD, \quad (13)$$

and

$$m_C + m_D + m_T = 1. \quad (14)$$

The proportions  $m_C$ ,  $m_D$ ,  $m_T$ , and  $e$  depend on portfolio decisions by the public and by the banks. In a system with contemporaneous-reserve accounting, the ratios  $k_D$  and  $k_T$  are fixed by regulation. Note also that the excess reserve coefficient  $e$  is normally very close to zero (in relation to the other coefficients).

From equations (10) and (11), we see clearly that monetary multipliers are influenced by portfolio decisions from the public and decisions from the banks. These decisions depend in turn on economic variables such as interest rates and income. In particular, if different reserve ratios are required on demand and time deposits (usually  $k_D > k_T$ ), both multipliers are affected by reallocations of deposits between demand and time deposits (changes of the form  $\Delta m_D = -\Delta m_T$ ). But  $h_2$  and the denominator of  $h_1$  remain unaffected by such changes if the reserve ratios are equal ( $k_D = k_T$ ). We see also that different multipliers can be more or less volatile depending on which asset proportions ( $m_C$ ,  $m_D$ , or  $m_T$ ) fluctuate the most.

In a system with lagged-reserve accounting, the ratios  $k_D$  and  $k_T$  also become endogenous. In this case, required reserves are determined on the basis of deposits in a previous period, say  $DD(-1)$  and  $TD(-1)$ :

$$RR_D = \bar{k}_D DD(-1)$$

and

$$RR_T = \bar{k}_T TD(-1), \quad (15)$$

where  $\bar{k}_D$  and  $\bar{k}_T$  are fixed by regulation, so that

$$k_D = \bar{k}_D DD(-1)/DD$$

and

$$k_T = \bar{k}_T TD(-1)/TD. \quad (16)$$

In theory, the coefficients  $k_D$  and  $k_T$  can take any value greater than zero. No regulation limits the expansion of current deposits, because required reserves depend only on past deposits. Further, if the banking system falls short of required reserves, the central bank “must” supply the reserves in some way. For these reasons, it is sometimes argued that lagged-reserve accounting undermines the possibility of controlling monetary aggregates by using the monetary base. Note, however, that the expansion of loans and deposits remains dependent upon decisions by profit-maximizing institutions. Falling short of reserves may have financial costs and may be an indication of bad management. The central bank can use “moral suasion” to discourage such situations. Besides, if reserves must be borrowed, the central bank can lend them at a penalty rate. Commercial banks thus have a strong incentive not to let their reserves fall below the required level and, in fact, to maintain excess reserves. The central bank can make that incentive stronger if it wishes

to do so. Further, in the short run, the central bank can manipulate the excess cash reserves of commercial banks (especially by transferring government deposits) and induce quick adjustments by these institutions. Whether lagged-reserve accounting actually undermines base control remains a controversial question.

The volatility and predictability of monetary multipliers is an empirical issue. Though, as we saw above, they depend in a rather complex way on several factors, multipliers can be observed frequently and with a short time lag (approximately a week). This property can, of course, be exploited in forecasts. Multipliers may also vary in response to changes in the base, and this possibility must be taken into account.

We define “interest rate control” as the procedure that uses the interest rate as an instrument. This approach is based on exploiting the money demand relationship of equation (4): the central bank forecasts the evolution of  $P$  and  $y$  over the relevant horizon and then pegs the relevant interest rate(s) at the level consistent with the desired level of  $M$ . It is then expected that market participants will adjust the level of the money supply at the target value

$$\bar{M} = \hat{P} m(\bar{r}, \hat{y}), \quad (17)$$

where  $\hat{P}$  and  $\hat{y}$  are the predicted values of  $P$  and  $y$ , and  $\bar{r}$  is the interest rate selected by the central bank.<sup>9</sup> Though this approach is often described as the use of interest rate(s) as instrument of monetary control, it is important to note that fixing interest rates (when these are not regulated) requires open-market operations — that is, buying and selling financial assets such as treasury bills and government deposits in commercial banks. The basic effect of these operations is to modify the level of high-powered money in the economy.<sup>10</sup> The direct instrument of monetary control remains the monetary base. Using “interest rates as instrument” can be viewed as a special *modus operandi* by which the central bank moves the level of the base in order to peg some interest rate. The level of the rate itself is decided in order to attain some growth rate of the monetary aggregate targeted.

Several conditions need to be met if this approach is to work. First, the central bank needs a good estimate of the money demand relationship. Both the fit and the stability of the relationship must be satisfactory. Second, the central bank must be able to forecast  $y$  and  $P$  accurately enough over the required period. Third, it needs to take into account the fact that  $y$  and  $P$  are not invariant to the movements in the monetary base needed to influence the interest rate in the short run. For example, if an expansionary policy is used in the short run to lower  $r$ , this can have an impact on both inflation and real income. In particular, the relationship between interest rates and the nominal stock of money is indeterminate in a homogeneous money demand relationship. Even with  $y$  fixed, the

interest rate determines only the level of real money demand  $M/P$ , not the nominal demand  $M$ . Thus, both  $M$  and  $P$  may be multiplied by an arbitrary factor. In the short run, this indeterminacy may be solved by price inertia. This requires being able to predict the dynamic adjustment of prices and output to the actions of the central bank. Otherwise, overshooting can lead to gyrations in money and prices. Fourth, it is important that the money market adjusts quickly so that the equilibrium condition is satisfied over the period. In particular, it is important that this adjustment occurs faster than adjustments in  $P$  and  $y$ , which could also bring the market back to equilibrium.<sup>11</sup>

From this discussion, we see that the controllability of various aggregates depends on several factors. Different aggregates are not equally controllable. Further, different control procedures may have to be applied to different aggregates. Control by the base method depends on the predictability of the monetary multiplier, while control by the interest rate method depends on the characteristics of the money demand equation and on the predictability of other variables appearing in it.

In view of the complexity of the issues involved, it is not surprising that the issue of selecting a control instrument is controversial. At least three criteria for the selection of a control instrument or control procedure can be considered: the controllability of the instrument, the closeness of the link between the instrument and the aggregate targeted, and the implications of using an instrument for other economic variables (White, 1979).

On the two first criteria, White argues that there is little to choose between the two main methods of control and, thus, the criterion that should determine the choice is the third one. He stresses the fact that control through interest rates reduces the volatility of interest rates, while base control would require large interest rate movements. In view of this, he concludes that the interest rate mechanism is preferable.

Freedman (1981a) also criticizes the possible effect of base control on interest rate volatility. He considers a number of money demand and money supply models and uses them to study the consequences of base versus interest rate control of the money supply. In simple cases he finds that both mechanisms are equivalent. In more complex cases, where money demand depends on lagged values of the interest rate, he finds that the base control mechanism can lead to explosive oscillations of the interest rate. Similarly, the presence of a lagged-reserve accounting (versus contemporaneous accounting) can lead to oscillations (possibly explosive) of the interest rate.

The problem raised by Freedman (1981a) is an illustration of the “instrument instability” problem previously analyzed by Holbrook (1972) (see also Ciccolo, 1974; and Pierce and Thompson, 1972). The presence of lagged values of the interest rate in the money demand equation or lagged reserve accounting implies that the behaviour of the interest rate is governed by a (non-homogeneous) difference equation

where money plays the role of a disturbance. For certain values of the parameters, this equation may not have a stable solution, because of the presence of an unstable root. In such cases, rigid control of the money supply (or the monetary base) can lead to explosive oscillations. The question, of course, is whether the true relationships are such that this type of phenomenon can arise in practice.<sup>12</sup>

Other authors question the efficiency of base control of monetary aggregates or the controllability of the base itself. Fortin (1979) and Sparks (1979) both insist on the difficulties caused by lagged-reserve requirements and by the variability of monetary multipliers. But they provide no detailed discussion or empirical evidence of their view.

Clinton and Lynch (1979) study monetary multipliers for a narrow aggregate (M1) and a broad aggregate (currency + total deposits in banks), but view them as too volatile for base control to work. They also perform causality tests between the aggregates and the monetary base (or bank reserves), and compare the performance of a multiplier model with a money demand equation.<sup>13</sup> They find that the multiplier model and the money demand model provide forecasts of comparable accuracy. Further, causality appears to run from the monetary aggregates to base money and not the reverse. They conclude that base control is not likely to work.

In contrast, Courchene (1979, 1981a, 1981b, 1983a, 1983b) considers that the interest rate mechanism selected by the Bank of Canada to control the aggregate targeted (M1) is too indirect and inefficient. Instead, he argues, the Bank of Canada should monitor the base, over which it has complete control, and use the multiplier mechanism to attain its objective. Courchene (1979) interprets the evidence on causality running from monetary aggregates to the base (Clinton and Lynch, 1979) as a reflection of current operating procedures. In view of the possible difficulties created by lagged-reserve accounting in the context of base control, Courchene recommends a switch to contemporaneous-reserve accounting. Further, he advocates that borrowing from the central bank should be allowed only at penalty rates — that is, at rates appreciably above the rates at which the banks can lend the funds. Both these measures are suggested to improve the controllability of monetary aggregates.

Howitt and Laidler (1979) question the assumption that the supply of money adjusts automatically to the demand from month to month. In their view, this is implausible, since demand and supply can diverge for several months. Further, this imprecise influence on the supply and the possibility that the central bank may peg the interest rate too low may lead to an explosive inflationary process. They present a model to illustrate this possibility. They conclude that the use of interest rates is an inefficient and possibly destabilizing technique for implementing monetary targeting.

More recently, Lane (1983) studied some of the arguments against

base control in greater detail. Looking at the possibility of instrument instability because of the presence of a lag structure of interest rates in the money demand function, he considered two possible explanations: one based on expectations and one based on adjustment costs. Assuming rational expectations, he found "the notion that interest rates would explode if the money supply were controlled according to a preannounced target path to be groundless"; on the contrary, "attempting to stabilize interest rates within the context of money-supply targets would create expectations of patterns of interest-rate movements and thus might be destabilizing." Further, "smoothing interest rates may actually generate the empirical evidence which has been adduced to justify such intervention."

Similarly, he studied the effect of lagged-reserve accounting by using a model that incorporates the optimizing behaviour of banks and rational expectations. He found that the possibility of destabilization is considerably mitigated by banks' portfolio adjustment behaviour. Further, he challenged the relevance of the evidence from causality tests (Clinton and Lynch, 1979) by constructing a simple model that shows that, although the central bank can use the base to control the money supply, causality tests will indicate that money causes the base.

### *Selection of Aggregate and Target Growth Rate*

The central bank can try to control a large number of aggregates (see Table 5-1). Which one is preferable is largely an empirical question that is difficult to settle by theoretical means. The central distinction to be made here is between narrow and broad aggregates. Should the central bank try to control a narrow or a broad monetary aggregate?

Monetary aggregates are not generally viewed as variables that have a direct economic interest. What one has in mind in targeting an aggregate is to hit another objective of more interest from the welfare point of view. Typical variables considered include the level of prices ( $P$ ), real income ( $y$ ), and nominal income ( $Y$ ). The choice of the aggregate depends on the possibility of influencing one or several of these variables by controlling it. For example, if one is interested in controlling inflation, the aggregate most strongly related to prices should be selected, provided it is sufficiently controllable. If the ultimate target of monetary policy is real income, the aggregate whose fluctuations are most strongly related to those of real income would be preferable.

White (1979) considers that the objective of monetary policy should be to minimize cyclical fluctuations in nominal income. From this point of view, he concludes that there is little to choose between narrow and broad aggregates. But he also stresses the impact of controlling various aggregates on other financial variables, especially interest rates. Because the demand for broad aggregates is less interest-elastic and

more income-elastic than the demand for M1, we can expect that controlling a broad aggregate will lead to more volatile interest rates.

The argument to support this conclusion can be explicated as follows. Consider the demand equation

$$\ell n(M/P) = \beta_0 + \beta_1 \ell n(y) - \beta_2 \ell n(r) + u, \quad (18)$$

where  $\beta_1$  is the income elasticity of money demand,  $\beta_2$  is the interest elasticity, and  $u$  is a random shift variable ( $\beta_1 > 0, \beta_2 > 0$ ). Suppose that we are controlling the money stock  $M$ . If we isolate the interest rate on the left-hand side, we get

$$\begin{aligned} \ell n(r) = & \frac{\beta_0}{\beta_2} + \frac{\beta_1}{\beta_2} \ell n(y) - \frac{1}{\beta_2} \ell n(M) \\ & + \frac{1}{\beta_2} \ell n(P) + \frac{1}{\beta_2} u. \end{aligned} \quad (19)$$

We see easily that the smaller the interest rate elasticity  $\beta_2$ , the greater will be the response of the interest rate to a change in any of the variables on the right-hand side (real income, price level, money stock, or random shock to money demand). Further, the greater the income elasticity  $\beta_1$ , the greater the response of the interest rate to a change in real income. White (1979) observes that the demand for broad aggregates is usually more income-elastic and less interest-elastic than the demand for a narrow aggregate such as M1. In other words, the *LM* curve is steeper for a broad aggregate and responds more strongly to given movements in the value of the aggregate, the price level, or the random term than does a narrow aggregate. He concludes that controlling a broad aggregate will lead to greater interest rate volatility than controlling a narrow aggregate. For this reason, the central bank should use a narrow aggregate as its target.

This conclusion could be reversed if the variance of the random shocks ( $u$ ) is smaller for a broad aggregate or if the demand for broad aggregates is more stable than the demand for M1. Further, if we accept the empirical observation that  $\beta_1/\beta_2$  is larger for a broad aggregate, a decrease in real income will reduce interest rates more when a broad rather than a narrow aggregate is controlled: countercyclical movements in interest rates are stronger. Because the *LM* curve for a broad aggregate is steeper, shocks to the *IS* curve (that is, shocks to consumption or investment) have a smaller effect on real income, while the effect of shocks to the *LM* curve is ambiguous. From the point of view of stabilizing real income, targeting a broad aggregate may be preferable.

Further complications appear if we take into account the fact that the demand for a broad aggregate depends also on the interest rate ( $r_d$ ) paid

on the savings deposits included in the aggregate. Namely, suppose that

$$\ln(M/p) = \beta_0 + \beta_1 \ln(y) - \beta_2 \ln(r) + \beta_3 \ln(r_d) + u, \quad (20)$$

where  $\beta_3 > 0$  (for an increase in the rate,  $r_d$  should increase the demand for the deposits considered). Here, the demand for money may well increase as the general level of interest rates increases, for it is the structure of the rates that matters. The relation between money and interest rates is appreciably more difficult to predict. Note also that this can undermine the possibility of controlling a broad aggregate through an interest rate mechanism.

The Bank of Canada officially abandoned M1 targets in November 1982. Freedman (1983) believes the main reason was that M1 ceased, at least temporarily, to be a reliable guide for policy. Mainly because of financial innovations in recent years, the demand for M1 shifted considerably. The main innovations were the introduction of daily interest savings and daily interest chequing accounts and the development of cash-management techniques for corporate accounts, such as consolidation of funds from geographically dispersed sources, payroll service plans, and arrangements for investment of overnight funds. All these changes have the effect of reducing the desired levels of demand deposits and current accounts, and therefore the demand for M1 is reduced. Since the interest rate control mechanism used by the Bank of Canada depends crucially on its estimate of the demand for M1, this clearly poses an important problem. The problem was judged important enough to abandon M1 targets. But no precise alternative has been adopted.

Freedman (1983) considers three options: retain the existing definition of M1, try to measure the shift, and establish a new target range; redefine the aggregate targeted to take the shifts into account; or create a new aggregate that adds back the fraction of any new instrument that represents the shift out of the previous aggregate — for example, shift-adjusted M1B. Freedman sees problems in all three options. Structural shifts are difficult to model, especially when they are not due to regulatory changes. Broad aggregates have savings characteristics, and their demand schedules contain more variables — for example, wealth and the rates paid on the deposits. Shift-adjusted M1B is difficult to apply because of the lack of information. The work on the revised aggregates is not completed.

Among the commentators on monetary policy in Canada, the most prolific is Thomas Courchene (1971, 1975, 1976, 1977, 1981a, 1981b, 1983a, 1983b). Courchene considers that the main purpose of monetary policy should be the control of inflation and favours for that purpose the policy of monetary targeting. But Courchene is very critical of the way this policy was implemented after 1975. He argues that the interest rate mechanism selected by the Bank of Canada to control the aggregate targeted (M1) is too indirect and inefficient. On the problem of selecting

an intermediate monetary target, his position can be summarized as follows.

First, M1 is too narrow and its link with other economic variables is exposed to shifts resulting from technical changes. Eventually, the demand for the most important component of M1 (demand deposits) may even go to zero. A broader aggregate for that purpose is less likely to be affected by shifts between various types of deposits and constitutes a better guide for monetary policy. On this issue, Courchene (1979, pp. 610–11) observes:

A second set of reasons why I feel the Bank of Canada should become more serious about base control concerns the fact that the Bank may have to jettison interest rate control either because a broader aggregate may at some point become the preferred monetary aggregate or because M1 can no longer be controlled via interest rates. In terms of the former, the issue is in part precisely one of the two that White addresses: is M2 a better predictor of the future path of nominal income than M1? This question is of course an empirical one, and while my bias is in favour of a broad definition I have no further evidence to support my view than that to which White alludes. Secondly, as the near future is concerned the demand deposit component of M1 may be subject to substantial change. Part of this is due to the “unbundling” of services provided by the chartered banks. In return for holding demand deposits of a certain size, bank customers receive certain services “free” of charge. There has been, I think, a recent tendency for banks to move toward marginal-cost pricing of their “services” so that demand deposits by themselves will no longer “buy” these services. In turn, this will reduce the demand for these sight deposits. Of more importance is the fact that the chartered banks now have (or soon will have) the technology for “managing” corporate accounts on behalf of clients, so that at the limit demand deposits could be cleared daily into interest-bearing overnight deposits. In short, the velocity of demand deposits may approach infinity, and the Bank will be forced to monitor a broader aggregate. If this process is gradual, of course, a well-specified demand function can capture and accommodate the rise in velocity. Nonetheless, it does represent a potential problem for monetary control based on monitoring M1.

Second, Courchene argues that one of the main reasons why the Bank selected M1 as its target is the control mechanism itself. Because M1 contains mainly assets on which, for all practical purposes, no interest is paid, the demand for M1 is more sensitive to the level of interest rates than broader aggregates on which competitive interest is paid. The demand for broad monetary aggregates depends on the interest differential between non-monetary assets and the deposits included in the aggregate. The differential is clearly much more difficult to control than the level of interest rates. Consequently, M1 is probably the only aggregate over which we can attain a reasonable degree of control through an interest rate mechanism. A widening of the aggregate would entail a change of the control procedure.

Third, the reduction of monetary growth rate targets was probably too gradual. A reduction of inflation with minimal real effects requires a reduction of inflationary expectations as well, and a gradual reduction may be inefficient in that respect.

Fourth, Courchene argues that the targeting of exchange rates, rather than monetary targeting, became a prominent consideration as early as 1978 and that M1 targeting was effectively abandoned in mid-1981, a year before it was officially abandoned. Overall, he believes that monetary targeting was applied at most for a short period and very gradually, so that it is difficult to assess whether the policy was a success.

Howitt and Laidler (1979) also argue that the aggregate chosen as intermediate target matters. They note that during the 1975–79 period, narrow and broad aggregates were negatively correlated. Different aggregates gave very different messages about the expansionary character of monetary policy. During the period considered, M2 grew much faster than M1. Besides, from 1975 until 1978, M1 was off target half the time.

This summarizes, in our opinion, the main views that were put forward on monetary targeting in Canada. Other studies and discussions that can usefully complement these include: from the research staff of the Bank of Canada, K. Clinton (1974, 1976); Clinton and Lynch (1979); Cockerline and Murray (1980, 1981a, 1981b); Dingle, Sparks, and Walker (1972); Duguay and Jenkins (1978); Freedman (1978, 1981a, 1981b, 1982, 1983); Freeman (1978, 1981a, 1981b); Thiessen (1982); White (1976); White and Poloz (1980); from other sources, Abrams, Froyen, and Waud (1979); Carr and Smith (1975); Donner and Peters (1979); Gregory and Raynauld (1983); Hamburger (1981); McCallum (1983); Pesando and Smith (1973, 1976); Peters and Donner (1979); Sumner (1980); Théorêt (1979a, 1979b); White (1976); Wirick (1981).

We now consider the empirical evidence.

## **Empirical Evidence**

To answer some of the questions raised above, we first review the relatively limited empirical literature on the control of monetary aggregates; second, we consider money demand in Canada, in view of the problems of monetary control; and third, we examine the evidence on the relationship between money and three basic ultimate targets: real income, nominal income, and inflation. In the latter case, the literature reviewed deals almost exclusively with reduced-form models, for such models are probably the best suited to answer our questions.<sup>14</sup> Indeed, structural models — that is, relatively detailed economic models with a large number of equations — are generally specified in a Keynesian context and usually exhibit rather weak monetary transmission mechanisms (see Aubry and Kenward, 1981).

## *Monetary Multipliers and Empirical Studies of the Control Process*

Empirical studies on the controllability of various monetary aggregates and the efficiency of different control procedures are very scarce in Canada. The three main studies are those by Clinton and Lynch (1979); Dingle, Sparks, and Walker (1972); and White and Poloz (1980).

Having already summarized the conclusions of Clinton and Lynch (1979), we will make just three remarks here. First, as the authors note, the fact that the monetary multipliers (for M1 and M2C) are not constant does not imply that they cannot be predicted (for example, through time-series techniques). A descriptive analysis of monetary multipliers provides no decisive evidence on this question, which is the central issue here. Second, the causality tests indicating that causality runs from the monetary aggregates to the monetary base (or bank reserves) may just reflect the reaction function of the central bank. Indeed, Lane (1983) produced a simple model where money affects the base, even though the central bank can control the money supply with the base. Third, the comparison between the forecast of a multiplier equation with those of a money demand equation are not those one would like to consider, since both equations use current values of endogenous variables and thus do not yield *ex ante* predictions. It is difficult to get any firm conclusion from these results.<sup>15</sup>

Dingle, Sparks, and Walker (1972) describe in detail the process of reserve adjustment by commercial banks to meet required reserves and estimate a monthly model of earning liquid assets. They find that the adjustment of assets is very sensitive to the time path of excess reserves. In related work using daily data, White and Poloz (1980) study the demand for excess reserves by five large chartered banks. Though the estimated demands have several satisfactory properties, one of the main observations we can make from this work is that the demand for excess reserves is difficult to model. The latter authors conclude that rigid adherence to a growth rate of excess reserves may lead to unwarranted movements in interest rates and the money stock. Another possible implication is that the Bank of Canada's approach to influencing interest rates through movements in chartered bank adjustment items is unreliable.

On the whole, we found little empirical evidence on the controllability of various monetary aggregates and the appropriate method of control.

## *Money Demand*

We have found that a number of characteristics of money demand functions affect the selection of an intermediate monetary target and the method of control. The main characteristics include: the closeness of the

relationship (standard error); the stability of the relationship over time;<sup>16</sup> and the numerical values of the income and interest elasticities. In order to throw some light on these issues, we examined the empirical work on money demand in Canada. Among this considerable literature, the most important papers are those that compare alternative aggregates and study the stability of the relationships (especially Boughton, 1981; Cameron, 1979; Clinton, 1973; Cockerline, 1979; Cockerline and Murray, 1981a, 1981b; Foot, 1977; Ram, 1982; Rausser and Laumas, 1976; and Short and Villanueva, 1977).<sup>17</sup>

Our main observations are as follows. First, the fit of the demand functions, as described by the standard error of the regression, is generally better in demand for broad aggregates (M2) than for narrow aggregates (M1). We can see this, for example, from Boughton (1981), Cameron (1979), Clinton (1973), Cockerline and Murray (1981a, 1981b), Ram (1982) and White (1976); two other studies (Cockerline, 1979; Rausser and Laumas, 1976) report mixed or ambiguous results. The fact that the standard error of the residuals is smaller for broad aggregates should also be related to the fact that the dependent variable for broad aggregates is larger; hence money demand is better explained in both absolute and relative terms.

Second, the results on temporal stability are mixed: Clinton (1973) and Foot (1977) find that the demand for a narrow aggregate M1 is stable, while the demand for broader aggregates is unstable (though Foot shows specifications of broad money demand that seem stable); Rausser and Laumas (1976) find the opposite; Boughton (1981), Cameron (1979), Cockerline (1979), Cockerline and Murray (1981b), and White (1976) find indications of unstable demands for both narrow and broad aggregates; Ram (1982) finds both to be stable. Cameron (1979) also concludes that shifts in M1 were gradual, while shifts in M2 were abrupt. Overall, it seems that demands for both narrow and broad aggregates show signs of instability.

Third, the evidence on interest elasticities is also mixed: five authors find the highest interest elasticities in the demand for M1 (Boughton, 1981; Cockerline, 1979; Cockerline and Murray, 1981a, 1981b; Ram, 1982; White, 1976) while two show the opposite (Cameron, 1979; Clinton, 1973). However, the demand for broad aggregates includes several interest rates, usually the difference between the rate on a treasury bill (or a bond) and the rate paid on deposits. It is easy to understand that differentials between rates are very difficult to control.

Fourth, in most cases, the income elasticities are generally larger for broad aggregates (Boughton, 1981; Cameron, 1979; Cockerline, 1979; Rausser and Laumas, 1976), though Clinton (1973) and White (1976) show ambiguous results.

Finally, Short and Villanueva (1977) studied the substitutability of various financial assets and found that items not included in the standard

definition of M1 (chequable deposits in non-bank financial institutions) have a high substitutability with it. This suggests that they should be included.

In conclusion, evidence of instability in demand for money does not necessarily imply that demand cannot be useful for the purposes of monetary control. Everything depends on the importance of the instability observed. Further, in assessing the reliability of a relationship, at least two factors must be taken into account: the quality of the fit, and the stability of the relationship. An unstable relationship may be preferable to a stable one if the fit is better; in fact, the former may appear statistically unstable because the greater accuracy of estimation yields tests that have greater power. From the evidence, we cannot conclude that demand for broad aggregates is less reliable than demand for narrow aggregates, or vice versa.

### *Money and Real Income*

Economists generally agree that money is neutral in the long run. This means that money will only affect prices but will have little effect on real variables. However, within the framework of the rational expectations hypothesis, some economists assert that money can be neutral even in the short run, and that money affects output in the short run only if the movements in money are unanticipated; further, systematic errors are impossible (see Barro, 1976; Lucas, 1972; Lucas and Sargent, 1981; and Sargent and Wallace, 1975).<sup>18</sup> Of course, such a theory leaves little room for a systematic monetary policy aimed, for example, at stabilizing real income or decreasing the unemployment rate. Rather, it leads to the adoption of a monetary rule. Once anticipated, a systematic monetary policy would have no effect on real variables in the economy.

This theory has been tested in many different contexts and, interestingly, the results obtained in the Canadian context are especially strong. Several researchers find that the short-run neutrality proposition cannot be rejected in the Canadian context. Saidi and Barro (1976) use annual data over the 1950–74 period and distinguish between the fixed and the flexible exchange rate regimes. In both cases, they find that only unanticipated monetary shocks (M1 definition) affect real output or unemployment. Wogin (1980) comes up with very similar results using a broad definition of money (M2C) and annual data over the period of 1926 to 1972. Finally, Hoffman and Schlagenhauf (1982) find a very strong result for Canada: for the period from 1960/I to 1980/IV, using a broad monetary aggregate (M2), Canada ends up being the only one of six industrial countries for which the hypotheses of rational expectations and of short-run neutrality cannot be rejected jointly or separately.<sup>19</sup>

The neutrality results thus seem to be robust in the Canadian context, since they hold for different samples, and different definitions of money

and since they have been tested with different methodologies. Without suggesting that these results should be taken at face value, we think that their policy implications should be taken seriously. Indeed, our intention here is not to settle the debate on activism, which is presently going on in the international literature, but only to point out the policy implications of the results based on Canadian data.

Besides, Jarrett and Selody's (1982) results on the relationship between inflation and the fall in productivity in Canada during the 1970s suggest that, if monetary policy is not neutral, it may well have perverse effects. Indeed, they show that the decrease in productivity cannot explain an important portion of inflation in the 1970s in Canada, but that inflation itself can explain most of the fall in productivity during the same period. Thus, a sustained monetary expansion could lead to falling real income.<sup>20</sup> These studies suggest that Canadian monetary policy should aim mainly at prices and that a monetary rule may well be preferable to discretion if we intend to minimize the variance of real income in the short run.

### *Money and Nominal Income*

Two aspects of the literature on the relationship between money and nominal income are of interest to us in this study: first, reduced-form equations relating nominal income to various definitions of money, especially in view of finding the "best" definition of money; second, "causality" tests between money and nominal income for the purpose of finding the direction of causality between money and nominal income.

#### THE DEFINITION OF MONEY

In an effort to find the "best" definition of money, several authors estimated reduced-form equations relating nominal income to past and present values of money (G. Clinton, 1974; Duguay, 1979a, 1979b; Kelly, 1981; Selody, 1978). The problem is to find the aggregate that shows the strongest relation with nominal income or yields the best predictions of nominal income. G. Clinton (1974) and Duguay (1979a, 1979b) both consider equations of the St. Louis type but end up with contradictory answers.<sup>21</sup> Clinton finds that M2 explains a greater proportion of the variance of nominal income than M1 does, while Duguay finds the opposite,<sup>22</sup> though Selody (1978) and Kelly (1981) each obtain answers that depend on the criterion used and the period considered. For example, by considering the fits of regressions of income on money, Selody (1978) finds that the best definition is M2 for the early 1970s and M1 for the late 1970s; on the basis of ex post predictions, the results favour a very broad aggregate which includes Canada Savings Bonds; when considering controllability (relation of instrument to the intermediate

target), the same broad aggregate is favoured with M1 and M3 close seconds. By contrast, Kelly (1981) finds that the equation for M1 has the best fit, while the monetary base yields the best predictions. Thus, no clear choice emerges from these studies.

## THE CAUSALITY BETWEEN MONEY AND INCOME

Another way to look at the relationship between money and nominal income is to examine whether money affects nominal income or vice versa. "Causality" is defined here in a very specific way (Granger, 1969). Causality tests allow us to assess whether past values of a variable  $X$  can help predict another variable  $Y$ , once the past of  $Y$  is taken as given. In other words, one examines whether the "innovations" in  $Y$  — the portion of  $Y$  that cannot be predicted from its own past — could be predicted by using past values of  $X$ . If  $X$  causes  $Y$  but not vice versa, causality is unidirectional from  $X$  to  $Y$ ; similarly, causality may be unidirectional from  $Y$  to  $X$  or bidirectional (feedback). Further,  $X$  and  $Y$  may not cause each other, in which case they are independent or possibly contemporaneously correlated. Causality tests are especially sensitive to relationships between time series at the level of their "innovations," or short-run deviations from trend. But they may not be powerful enough to detect long-run relationships. Further, it is not always the case that "Granger causality" can be interpreted as the indication of "causal influence" in the regular sense. It is important to keep in mind these limitations while looking at the results of such studies (see Montmarquette and Forest, 1979; Zellner, 1979).

On the causality relations between M1 and nominal income in Canada, widely divergent results were obtained, depending on the sample period and the test used: there is no relation at all between the two variables (Auerbach and Rutner, 1978); causality is bidirectional (Barth and Bennett, 1974; Choudhri, 1983; Hsiao, 1979a, 1979b, 1979c; Syed, 1980); money affects income (Dyreyes, Starleaf, and Wang, 1980; Sharpe and Miller, 1975; Syed, 1980). But authors who tested causality between M2 and nominal income found no causation between these two variables (Barth and Bennett, 1974; Hsiao, 1979a, 1979b, 1979c; Sarlo, 1979).

The studies of Sarlo (1979) and Sarlo and Binks (1981) are especially interesting because they distinguish between periods of fixed and flexible exchange rates. Money in a flexible exchange rate regime can be used independently for domestic purposes, and thus causality should run from money to income, while it is inefficient for domestic objectives in a fixed exchange rate regime so that causality should run from income to money. With data adjusted for seasonality, Sarlo (1979) and Sarlo and Binks (1981) find that money (M1) affects nominal income in the flexible exchange rate period of 1952–61, but they find bidirectional causality during the fixed exchange rate period of 1962–70. Further, they find that

income affects money after 1970, which suggests that the exchange rate was not truly flexible during this period.

To sum up, causality tests indicate a weak or varying relationship between money and nominal income: there is no consistent pattern of causation as the results depend on the sample period, the test used and the aggregate considered. Further, the direction of causality depends on whether the exchange rate is fixed or flexible.

## *Money and Inflation*

Economists generally agree that in the long run, money will mainly affect inflation. Opinions chiefly differ by their evaluation of the length of this “long run.” In the long run, if we are not all dead and even if we are, a deceleration of the growth rate of money will lead to a decrease in the rate of inflation.

Consider the data in Table 5-2. During the 1956–69 period, the inflation rate was low, while the growth rates of the two aggregates were also relatively low. During the 1970–75 period, the inflation rate more than doubled, while the growth rates of M1 and M2A more than doubled. In fact, Wirick (1981, p. 254) shows that in the long run “monetary factors alone would have led to an inflation rate of 11–12 per cent per year” during the earlier half of the 1970s.

During the 1975–81 period, the rate of inflation and the growth rate of M2A continued to increase. The diminution in the growth rate of M1 during the same period can be explained by substitutions toward deposits paying interest (because of high rates) and by financial innovations (daily interest rate deposits and cash management techniques) which gradually deprived this aggregate of its significance. Further, we can link the recent reduction of inflation to a drastic reduction of the growth rates of broad monetary aggregates in 1983. The latter were cut well below 10 percent in 1982–83 and inflation fell to 5.8 percent in 1983.

In the short run, the relationship between money and inflation is more complex. Some economists argue that inflation is not a monetary phenomenon but is mainly determined by supply factors. For instance, Donner and Peters (1979, appendix) argue that all monetary aggregates fail to measure the liquidity available to the public and that inflation is “structural”; that is, it is caused by factors such as energy price shocks. Barber and McCallum (1980, 1981, 1982) deny a comparative advantage to monetary policy in the fight against inflation. Through some estimations of price level equations (in terms of the money stock and real GNP), they show that M1 and M2 do not predict inflation well during the 1970s. By looking at a cross-sectional analysis of 18 industrialized countries, they conclude that inflation is more closely related to the degree of social consensus in each country, as measured by the level of strike activity, than to money (Barber and McCallum, 1982). However, the direction of

**TABLE 5-2 Rates of Growth of Two Monetary Aggregates and the Consumer Price Index (CPI)**

	Percentages		
	1956–69	1970–75	1975–81
M1	4.7	11.2	7.1
M2A	6.1	13.2	14.2
CPI	2.4	6.7	9.4

*Source:* Calculations from CANSIM data.

causation is not clear: was there more social consensus, or less strike activity, because government policies avoided excessive inflation or did the social consensus lead to less inflation?

Two questions about the connection between money and inflation are especially important. First, which aggregate is more closely related to the rate of inflation in the short run? Second, do the effects of money on inflation differ according to the exchange rate regime?

The first question was studied, using Canadian data, by Bordo and Choudhri (1982), Kelly (1981), Racette (1983) and Montmarquette and Forest (1979). The first three studies present regressions of inflation on past and present growth rates of money; the last one uses causality tests.

Bordo and Choudhri (1982) state that the rate of growth of M1 explains more precisely the rate of inflation, as measured by the GNE price deflator, than M1B or M2. They thus favour M1, but they present their results only with this definition; their sample period goes from 1971/I to 1980/IV (quarterly data). Considering a very similar period (1970/IV–1981/II), Kelly (1981) finds that M2 yields the best fit for an inflation equation where inflation is measured alternatively by the growth rates of the GNE price deflator, the personal consumption expenditure deflator and the consumer price index (CPI). But, when he tries to predict inflation with different monetary aggregates, he finds that M1 gives the best predictions of the growth rate of the CPI, although M2 is still the best predictor for the two other price indices. Using monthly data, Racette (1983) also finds that broad aggregates like M2 are the most closely related to inflation, even though the relationships show discontinuities in the second half of the 1970s.

On the other hand, Montmarquette and Forest (1979) perform causality tests between money growth and inflation and consider monthly data for three subperiods corresponding with different exchange rate regimes (1954/I–1962/IV, 1962/V–1970/V, and 1970/VI–1977/VII). For M1, they find that causality runs from the CPI to M1 during the 1962–70 and 1970–77 periods. For M2, they find no clear relationship during the flexible exchange rate regime of 1954/I to 1962/IV but clear causality running from M2 to the CPI during the 1962–70 and 1970–77 periods.

Though no overwhelming evidence is available, the existing results suggest that broad aggregates are more closely related to inflation than M1. Only Bordo and Choudhri's results favour M1. However, they present incomplete results in their study of broad aggregates, and their findings are clearly contradicted by those of Kelly (1981) and Racette (1983).

Studying the role of the exchange rate regime in the money/inflation relationship, Bordo and Choudhri (1982), Choudhri (1983), Pigott (1980), and Racette (1983) all show that the relation between money and inflation in Canada in the 1970s is clearly associated with that of a regime of fixed exchange rate. International variables, like U.S. prices and money, play an important role in the Canadian inflation process. Choudhri (1983) and Pigott (1980) both find that the international transmission of inflation did not vary significantly in the 1970s, compared with the 1960s, which were characterized by a fixed exchange rate. So it is not surprising that most studies of inflation in the 1970s found a weak effect of Canadian money on inflation. Using cross-spectral analysis, and controlling for the effect of supply shocks, Winer's (1983) results indicate that the exchange rate was relatively flexible in Canada after 1973. Nevertheless, he finds feedback from U.S. prices to Canadian prices at periodicities of business cycle length (medium run), which is probably a reflection of exchange rate management by the Bank of Canada.

## *Conclusions*

The main conclusions that emerge from our review of the various aspects of the empirical literature related to the problems of monetary control are:

- There is very little empirical evidence on the control process or the choice between control instruments. No available data allow us to reach definite conclusions on the problem of selecting the appropriate method of control.
- The extensive literature on the demand for money shows mixed results on the characteristics of money demand relevant for monetary control. On the whole, we can make three observations. First, demand for broad aggregates shows lower standard errors than demand for narrow aggregates. Second, there is evidence of instability for all types of aggregates. Third, the income elasticities of demand for broad aggregates are generally larger than those for narrow aggregates, while the opposite holds for interest elasticities. This final observation suggests that the control of a broad aggregate may have a greater stabilization effect on real income (as a built-in stabilizer), in the face of shocks to the *IS* curve, than the control of a narrow aggregate. The same observation also suggests that interest rates may

be more volatile when a broad aggregate is controlled, but this conclusion could be reversed if the variance of disturbances is sufficiently small for broad aggregates.

- The empirical literature on the relation between money and real income indicates a weak link and thus suggests that real variables, such as real income or unemployment, are not viable ultimate targets for monetary policy.
- Two conclusions emerge from the empirical literature on the relation between money and nominal income. First, causality tests indicate a weak or varying relationship between money and nominal income. The direction of causality depends on the exchange rate regime. In particular, income affects money in fixed exchange rate periods (possibly with feedbacks) or during managed floats, confirming the non-autonomy of monetary policy under such conditions. Second, no clear conclusions emerge from the various reduced-form studies on the “best” definition of money. Further work seems required in this area, especially in view of the recent financial innovations.
- There is a widespread agreement, in Canada and elsewhere, about the existence of a long-run positive relationship between money and inflation. However, the evidence from the 1970s suggests that supply shocks can play a significant role in short-run fluctuations of measured rates of inflation. This decade is also characterized by an international transmission of inflation more akin to a fixed than a flexible exchange rate regime.
- Broad aggregates appear more related to inflation than the narrow aggregate M1. Consequently, if the ultimate target of monetary policy is to control inflation, a broad aggregate is likely to be preferable.

## Perspectives

Though the policy of the Bank of Canada after 1975 has been described as being “monetarist” (Barber and McCallum, 1980, 1981; Donner and Peters, 1979), serious doubts have been raised about whether this is a correct characterization. In particular, the procedures used (interest rate as instrument, M1 as target), the gradualism of the policy, and the change of emphasis toward the exchange rate were criticized (Courchene, 1979, 1981b, 1983b). Irrespective of the correct interpretation, the Bank of Canada has now, at least temporarily, officially abandoned monetary targeting, which is the basic feature of a monetarist policy. Recently, the prominent consideration seemed to be the stabilization of the external value of the dollar. In any case, we can consider that the Bank of Canada is now in search of a new policy (see Freedman, 1983; Courchene, 1983a).

The monetary policy options are varied. It is convenient to classify them as covering a spectrum going from monetarism to Keynesianism, from rules to activism. If we view the policy of the Bank of Canada as

being somewhere between these two poles, we can say that it can go either way. In our analysis, we first consider the monetarist program as recently restated by Milton Friedman (1982). Second, we discuss two possible modifications to the current framework of intermediate monetary targets: changing the aggregate targeted, and changing the method of control. Third, we consider dropping monetary targeting altogether and discuss some recent proposals of Keynesian inspiration. Finally, we touch on a policy that may be especially relevant for a small open economy like that in Canada: exchange rate targeting.

## *A Monetarist Program*

M. Friedman (1982) recently restated in a succinct form the basic principles and recommendations of a monetarist approach to monetary policy. First, on the potential role and the objectives of monetary policy, Friedman states:

Three views have been held about the appropriate strategy: first, that monetary policy should be directed specifically at promoting full employment; second, that it should be directed at promoting growth through cheap money, through keeping interest rates low; and third, that it should concentrate on price stability.

Experience and not theory has demonstrated that the first two strategies are not feasible, that monetary policy is not an effective instrument for achieving directly either full employment or economic growth. As a result there is today a worldwide consensus, not only among most academic economists but also among monetary practitioners, that the long-run objective of monetary policy must be price stability, or, to put it more generally, control of the absolute level of prices, because the objective could be a specified rate of inflation or deflation. Such a long-run objective is in principle consistent with the short-run objective of pursuing the long-run policy in a manner that contributes to minimizing economic fluctuations, that avoids introducing unnecessary elements of disturbance into the economy. (M. Friedman, 1982, p. 100)

From this assessment, five general principles follow:

A monetarist policy has five points: first, the target should be growth in some monetary aggregate — just which monetary aggregate is a separate question; second, monetary authorities should adopt long-run targets for monetary growth that are consistent with no inflation; third, present rates of growth of monetary aggregates should be modified to achieve the long-run target in a gradual, systematic, and preannounced fashion; fourth, monetary authorities should avoid fine-tuning; fifth, monetary authorities should avoid trying to manipulate either interest rates or exchange rates.

(M. Friedman, 1982, p. 101)

Finally, drawing from these principles, Friedman formulates the following proposals:

1. Replace lagged reserve accounting with contemporary reserve accounting.
2. Make the discount rate a penalty rate, and tie it to a market rate so it automatically moves.
3. Eliminate any attempt to introduce a seasonal into the money supply. One of the greatest sources of obfuscation has been the talk about seasonally adjusted money supply. There is no seasonal in the money supply except what the Fed permits.
4. Set a target path for several years ahead for a single aggregate — for example, M2 or the base. It is less important which aggregate is chosen than that a single aggregate be designated as the target.
5. Make reserve requirements uniform for all components of that aggregate.
6. Estimate the change over an extended period, say three or six months, in the Fed's holdings of securities that would be necessary to approximate the target path over that period. Divide that estimate by 13 or 26. Let the Fed purchase precisely that amount every week in addition to the amount needed to replace maturing securities.
7. Eliminate all repurchase agreements and similar short-term transactions.
8. Finally, announce in advance and in full detail the proposed schedule of purchases and stick to it (M. Friedman, 1982, pp. 116–17).

Despite the fact that these recommendations were originally proposed for the United States, most of them could easily be adapted to the Canadian economy. In our view, the most important ones are proposals 1, 2, 4, and 5. In proposal 4, Friedman insists on having a unique target, and views an aggregate broader than M1 or (at the opposite side of the spectrum) the monetary base itself as plausible targets. Monetary policy is easier to interpret and evaluate if the announced target is unique, and this can be important to enforce the target and thus to establish the credibility of the policy. Although the Bank of Canada never officially used multiple monetary targets, it has put a great emphasis on the exchange rate as well — another form of multiple targeting.

The purpose of proposals 1, 2, and 5 is to improve the controllability of the aggregate chosen when a base control mechanism is used. On proposal 2, it is worthwhile mentioning that Canada currently operates a floating discount rate, which is set at 0.25 percent above the prevailing treasury bill rate. Apparently this policy is close to the one suggested by the proposal. But the Bank of Canada can peg the treasury bill rate relatively easily by open-market operations because of its important inventory of these securities. In practice, then, the float may be far from “clean.” Further, it seems difficult to describe a premium of 0.25 percent over the treasury bill rate as a penalty rate. Under a base control mechanism, banks may have to borrow more at the discount rate, for the Bank is then more rigid in setting the supply of (non-borrowed) high-powered money. Though the Bank has some room to offset the effects on the base of lending to particular institutions (through open-market oper-

ations or government deposit manipulations), it may have more difficulty doing so if the banking system as a whole is short of reserves; hence the importance of reducing the probability of such events.

It is important to note here that the adoption of monetary targets can have an effect on the conduct of fiscal policy. For example, an expansionary fiscal policy in conjunction with a restrictive monetary policy can lead to the necessity of increasing taxes or selling more bonds to the public. If the first solution is not adopted, the government may face an ever-increasing deficit, which may eventually become very costly or even impossible to finance. The monetary target must then be relaxed (that is, the deficit is monetized) or public expenditures reduced.<sup>23</sup> Those who propose relatively rigid monetary targets (such as Milton Friedman) usually favour the second solution, because it reduces the role of government in the economy. In general, a policy of monetary targeting limits the level of discretion not only in monetary policy but also in fiscal policy. In any case, there is a need to coordinate the two categories of policies.<sup>24</sup>

### *Change of Aggregate*

M. Friedman (1982) downplays the problem of selecting the most appropriate intermediate target. What matters most, in his view, is the adoption of a single target. Recent experience in Canada suggests, however, that the choice of an aggregate may be important.

Courchene frequently emphasized that an aggregate broader than M1 should have been monitored. The Bank of Canada abandoned M1 because it felt financial innovations were shifting the demand for M1. In his excellent discussion, Freedman (1983) examined two basic options:

- retain existing aggregate and establish a new target range; or
- redefine the aggregate targeted, by considering broader aggregates or shift-adjusted M1B.

After analyzing the problems associated with the different options, he concluded that further research is needed. The instability of the demand for M1 is viewed as a problem here, because this schedule plays a key role in the interest rate control mechanism adopted by the Bank of Canada.

From the point of view of controllability, it seems clear that the best intermediate monetary target is the instrument itself, the monetary base. Further, selecting the latter as intermediate target may make monetary policy easily observable and credible and limit discretionary policy changes. But the relationship between the intermediate target and the final target is also relevant. From the empirical evidence, it is not clear which aggregate (narrow or broad) has the most reliable demand when

both the quality of the fit and the stability of the relationship are taken into account. However, the reduced-form relationship between any aggregate and real income appears very weak, and the evidence on the relation with nominal income is ambiguous, while the level of prices seems most related to a broad definition of money. This type of evidence thus seems to favour adopting a broad monetary aggregate as intermediate target with the level of prices (or inflation) as the final target.

Another possibility we should mention here is the recent proposal by Benjamin Friedman (1982a, 1982b, 1983) to use a credit aggregate as an intermediate target for monetary policy, instead of or jointly with a monetary aggregate. "Credit" is defined as the outstanding indebtedness of all non-financial borrowers. He provides evidence for the United States that supports the use of a credit aggregate:

The empirical evidence considered in this paper supports a positive conclusion — at least in comparison with the major monetary aggregates — about the potential use of total net credit as an intermediate target variable on each of these four criteria. First, the relationship between total net credit and aggregate measures of nonfinancial economic activity, judged by several different methodological approaches, is as stable and reliable as the corresponding relationship for any of the monetary aggregates (or the monetary base). Second, dynamic analysis based on exogeneity tests and decomposition of variance shows that the information about subsequent movements in nonfinancial activity contained in total net credit is at least comparable to that contained in the M1 money stock. Third, relationships between total net credit and either the quantity of nonborrowed reserves or the federal funds rate are roughly comparable to the corresponding relationships for the principal monetary aggregates. Finally, data for a close approximation to total net credit are available on a monthly basis, and the relevant relationships based on the monthly data are also roughly comparable to the corresponding relationships for the monetary aggregates.

(B. Friedman, 1983, pp. 141–44)

The evidence on the credit-to-income relationship derives especially from examining the ratio of GNP to credit (which appears very stable) and regressions of GNP on present and past values of credit and a measure of fiscal policy (U.S. data). The results are compared with those of similar computations based on monetary aggregates (M1, M2, M3). B. Friedman (1982b) also presents comparative, but less complete, evidence from five different countries (Canada, Germany, Japan, United Kingdom, United States). For Canada, however, the evidence on the credit-to-income relationship seems to favour monetary aggregates (M2 or M1).

B. Friedman's results were criticized by Rasche (in B. Friedman, 1983), Meltzer and Davis (in B. Friedman, 1982a), Porter and Offenbacher (1983), and McMillin and Fackler (1984). In particular, Porter and Offenbacher show that variance decompositions based on vector auto-

regressions are very sensitive to a number of arbitrary assumptions, such as the ordering of the variables. Rasche also points out important ambiguities in Friedman's results.

The introduction of credit aggregates as a possible intermediate target certainly constitutes an interesting development. Their advantages, however, are not yet clear, and further empirical research is needed. Besides, using two intermediate targets (a credit and a monetary aggregate) is a source of confusion that undermines the monetary discipline that monetary targeting should provide (in the "rules-versus-discretion" paradigm).

Still there is a missing link in the discussion above. Even if some monetary (or credit) aggregate has a strong relationship with the final target, we may not be able to exploit this link if the aggregate is not well controlled. Both the controllability of an intermediate target and its relation to the final target need to be taken into account. We need to know how a feedback rule on the monetary base, guided by a given intermediate target, will bring results closer to the desired objective. From the point of view of controllability, narrow aggregates like the monetary base or M1 appear to have an edge over broader aggregates, because the demand for the latter depends on interest rate differentials rather than the level of the rates. But the evidence is much less clear if we use an alternative control procedure, like "base control." This leads us to consider the next alternative.

### *Change of Control Procedure*

One option not studied by Freedman (1983) is the possibility of changing the control procedure and using the monetary base (or non-borrowed reserves) as instrument instead of an interest rate. Indeed, there is little empirical evidence on the controllability of monetary aggregates. The main evidence (publicly) available is the paper by Clinton and Lynch (1979), but in our opinion it is very tentative and inconclusive. Empirical studies on the predictability of the monetary multipliers and the possibility of base control have been more numerous outside Canada (for example, Balbach, 1981; Bomhoff, 1977; Burger, Kalish, and Babb, 1971; Büttler, Gorgerat, and Schiltknecht, 1979; Hafer, Hein and Kool, 1983; and Johannes and Rasche, 1981; Pfaff, 1977, 1978; and the staff study of the Board of Governors of the Federal Reserve System, 1981). They confirm that multipliers can be predicted with reasonable accuracy and suggest that base control is an efficient method of monetary control.<sup>25</sup>

However, current institutions are not perfectly adjusted to the proposal of base control. Proposals 1, 2, and 4 (M. Friedman, 1982) describe three measures that would improve the controllability of monetary aggregates. On these, lagged-reserve accounting (LRA) is often accused of undermining the control of a central bank on the monetary base, for such a

bank must supply the required reserves (Fortin, 1979; Sparks, 1979). A simple solution to this problem is to use contemporaneous reserve accounting (CRA). Most theoretical and empirical studies support the view that CRA is preferable to LRA.<sup>26</sup> Possibly in view of this evidence, the Federal Reserve switched recently (February 1984) to a system close to CRA. Second, the adoption of CRA may force commercial banks to borrow more frequently from the central bank. To limit the importance of such borrowing, it is suggested that the discount rate be a penalty rate, tied to a market rate. Third, making reserve requirements uniform for all components of the aggregate targeted would eliminate movements of the multiplier because of shifts of preferences between these components. Consequently, the multiplier is likely to be more predictable.

Other methods of reserve accounting were also proposed by Laurent (1979, 1981) and Poole (1976). Poole suggests a form of marginal-reserve accounting. In such a system, in addition to present reserve requirements based on deposits in the previous reserve period, banks must hold supplementary reserves (positive or negative) equal to the change in reservable deposits between the current and the previous period (100 percent reserve requirement on new deposits). According to Poole, this system "would provide virtually complete money stock control on a weekly average basis." Laurent suggests "reverse-lag accounting" of reserves. During a given reserve period, a bank can use only the reserves held during the previous period to satisfy the reserve requirement. In other words, at the beginning of a given period, each bank knows the reserves available and can create deposits up to that limit. According to Laurent, this system provides an accurate weekly control over required reserves, allows banks to cut the cost of managing their portfolios, and eliminates excess reserves.

The four methods of reserve accounting (lagged, contemporaneous, marginal, reverse) were compared by Judd and Scadding (1980) from the point of view of their effects on short-run monetary control and interest rate (federal funds rate) volatility. They conclude that marginal accounting is probably the most efficient method from the point of view of monetary control, but contemporaneous accounting offers the best compromise between an accurate monetary control and a consideration of short-run interest volatility.

A general problem to take into account when studying possible changes to the control procedure on the aggregate controlled is the "Lucas critique" (Lucas, 1976). The fact that parameters of econometric models reflect the optimal decision rules of economic agents could mean that the stochastic characteristics of policies (for example, their predictability) play a role in determining these parameters. As a result, when policies change in a fundamental way, parameters can change, and econometric studies based on data from a different policy regime may not be reliable guides to study the consequences of implementing a new

regime. For example, it is possible that a change of operating procedure will modify the interest elasticity of money demand. See Walsh (1982, 1984), and Lane (1983). As things stand, this argument remains relatively theoretical. It is difficult to assess the empirical importance of such effects and, consequently, little evidence is available.

Finally, “political” problems may be associated with some of the reforms. In Canada, this remark applies especially to the adoption of a uniform reserve requirement on different types of deposits. Chartered banks compete with non-bank financial institutions (NBFIs) to attract deposits. However, the two categories of institutions are regulated differently. Chartered banks must hold required reserves on which no interest is paid. NBFIs may adopt federal or provincial charters and are thus regulated in various ways. But, generally, they can hold their reserves in interest-bearing assets (usually deposits in chartered banks).

Before 1967, chartered banks faced a uniform eight percent required reserve ratio. To improve the competitive position of the banks and assuming that the latter compete with NBFIs mainly for term deposits, the Bank Act of 1967 instituted a dual required reserve system; chartered banks had to hold 12 percent and 4 percent as reserves on their demand and term deposits. This allowed banks to compete with NBFIs on a more equal footing. More recently, the 1980 Bank Act reduced the 12 and 4 percent ratios to 10 and 3 percent respectively.

Re-establishing uniform reserve ratios is likely to be controversial. If the uniform ratio is higher than the current ratio on time deposits, the competitive position of chartered banks may be jeopardized. If it is set equal to the lowest current ratio, NBFIs see their competitive position weakened. Besides, if the federal government attempts to regulate all institutions including those with provincial charters in the same way, a debate over provincial and federal jurisdiction is likely to result. In our view, the second solution is probably the simplest and most feasible.<sup>27</sup> Despite the problems involved, we think that the possibility of using the base control procedure in Canada should be studied carefully.

### *Keynesian Perspectives*

Precisely because Keynesians oppose simple and fixed rules, it is relatively difficult to describe the “rules” of a monetary policy of Keynesian inspiration. But since we would like to do it anyway, we can do no better than quote the recent statement of James Tobin:

I have argued: that monetary policy cannot be governed by irrevocably fixed rules blind to actual economic developments; that policies responsive to events cannot be described fully in advance but ultimately depend upon discretion; that monetary authorities cannot escape responsibilities for real economic outcomes of significance to the society, as exemplified by recovery from the world depression; that choices of targets and operating rules

should be guided by the ways they interact with economic and financial structure to convert shocks of various kinds into macroeconomic outcomes and by the probabilities of the several kinds of shocks; that for periods long enough for velocity shocks to be identified and offset, a nominal GNP or final sales target is much preferable to any intermediate monetary aggregate. I have sketched a multistage framework for the conduct of monetary policy that embodies these ideas. I know that central bankers will object because explicit policymaking on these lines makes their responsibilities for important economic outcomes transparent. They prefer to hide behind less meaningful descriptions of what they are doing. But there is no reason for the rest of us to respect that preference. (Tobin, 1983, p. 517)

One of his main suggestions is that existing intermediate monetary targets should simply be dropped.<sup>28</sup> On the positive side, Tobin suggests replacing them by a nominal GNP target.

The proposal of replacing monetary targets by a nominal GNP or a net final sales target was recently discussed in greater detail by Gordon (1983a, 1983b).<sup>29</sup> Nominal GNP is the product of a real variable (real GNP) and a price index (the GNP deflator), both of which are generally viewed as worthwhile policy objectives. Gordon suggests fixing target growth rates in terms of nominal GNP, without an intermediate monetary target. One way to analyze such a policy is to consider the quantity equation  $Y = MV$ . If the monetary authority wishes to attain stated growth for nominal income  $Y$ , it must monitor  $M$  in order to offset shifts in velocity  $V$ .

A simple way to implement a nominal income target would be to maintain a stable growth rate for nominal income over a relatively long period (or try to do so). Such a policy may, to some extent, be viewed as a “rule” that anchors a nominal variable in the economy and thus also the price level (provided real income does not fluctuate wildly).<sup>30</sup> But Gordon does not suggest adopting a fixed growth rate for  $Y$ . He proposes, instead, selecting a growth path for  $Y$  designed to place the economy on its natural growth path, or the growth path consistent with the natural rate of unemployment. Also, Gordon opposes interest rate targeting by referring to the classical discussion of M. Friedman (1968).

To appreciate better the problems associated with this proposal, it is useful to consider again the extended quantity equation

$$Y = Py = VhB. \quad (21)$$

Since the monetary base is the direct instrument of the central bank, the latter must be able to find the appropriate trajectory that will lead to the desired value of  $Y$ . In practice, it must predict and offset shifts in both velocity and the money multiplier. A policy of monetary targeting appears simpler, because it requires only monitoring shifts in the multiplier. Given that central banks frequently emphasize the difficulty of simply controlling monetary aggregates, serious questions must be raised whether they have enough information to go a step further.<sup>31</sup>

Gordon does not supply an operational procedure that is well defined in terms of the proximate instruments of a central bank.

A second problem is the link between the path of nominal income and the path of real income. It becomes clear from a careful examination of the proposal that the designation “nominal income target” is somewhat misleading. The target is not fixed but depends in the end on a real income target, called “natural real income.” In the end, it appears little different from a real income target or “fine-tuning” of the economy. Its implementation requires knowledge of so-called “natural real income” and, more important, of the dynamic links between the direct instruments of the central bank, nominal income, and real income.

The idea of fine-tuning is a rather old one. The question whether it can be done is one of the main subjects of disagreement in the monetarist-Keynesian debate. Monetary targeting was gradually accepted in the 1970s, because correctly or not, the idea that monetary policy is a poor instrument to influence real variables became more widely accepted. Gordon restates the opposite belief in a slightly new guise, though he offers no new evidence.

But if nominal income targeting is interpreted as the adoption of a fixed growth rate for nominal income, or more precisely as a policy under which the central bank tries to maintain a stable growth rate of nominal income, such a policy would be more akin to monetary targeting.<sup>32</sup> Central questions remain, however, about its feasibility and whether it is an appropriate intermediate target. Nominal income is not as readily observable as a monetary aggregate. Further, if one of the basic purposes of a monetary rule is the maintenance of monetary discipline, it is not clear that such a “rule” does not leave too much “discretion” to the monetary authority (Poole, 1980).

### *Exchange Rate Targeting*

For a small open economy like that of Canada, the strategy of closely managing the exchange rate is possibly a good one. Given the size of the external sector, the “politicization” of the exchange rate value, and the difficulties associated with the adoption of an independent Canadian monetary policy in the past, it might well be one of the viable alternatives.

However, if this policy is adopted, we must be aware of the problems associated with it. First, we must be sure that the rest of the world, and especially the United States, is following an “acceptable” policy or that we are ready to accept the consequences of this policy. The second problem with such a policy is the choice of the exchange rate level to be pegged. A strict adherence to a specific exchange rate level that is not at equilibrium may well lead to a costly period of adjustment. Monetary policy cannot be used for internal stabilization under a fixed exchange rate. These caveats must be seriously considered before adopting an exchange rate strategy definitively.

## Summary and Recommendations

In this study, we reviewed the literature on the problems related to monetary control, particularly in the Canadian economy since 1975. After a brief presentation of the institutional background, we outlined the process of monetary policy within the framework of the “quantity equation.” We were thus able to present clearly the variables that are potential candidates as ultimate targets, intermediate targets, or control instruments. We then analyzed the selection of an ultimate target. We saw that this choice is directly related to the time horizon considered. In the long run, the only viable ultimate target is the level of prices; in the short run, since money may affect real and nominal variables, potential candidates are more numerous: price stability, unemployment, or the rate of growth of real output. Assuming the monetary authority should seek to minimize unnecessary shocks to the economy, we outlined three important problems associated with the choice of ultimate targets for monetary policy: the problem of gradualism, the choice of an exchange rate regime, and the level of discretion in monetary policy (rules-versus-discretion problem).

On the first problem, we argued that recent events indicate that a reduction of inflation within a reasonable interval may require a relatively abrupt policy shift instead of gradualism. On the exchange rate regime, we pointed out that the monetary authority has real leverage on internal objectives only insofar as the exchange rate is flexible. The adoption of a fixed exchange rate ties monetary policy to this external intermediate target and leaves little room for internal objectives.

The “rules-versus-discretion” issue is highly controversial and has an important influence on the adoption of a monetary aggregate as intermediate target. Indeed, we reviewed two bodies of literature dealing with the rationale for the adoption of an intermediate target. The “targets-and-instruments” literature considers that a monetary aggregate simply constitutes one of many indicators that supply information on the final targets of monetary policy. It does not provide a basis for adhering to a fixed growth rate of the money stock. Alternatively, the “rules-versus-discretion” literature stresses that the first role of monetary policy is to anchor the price level while avoiding unnecessary perturbations of monetary origin. In this context, we discussed two main arguments for adopting a monetary rule: first, a monetary rule may minimize “political noise” (short-run political interventions in a market economy); second, under the assumption of rational expectations, it could minimize the variability of both real income and the price level. Thus, differences on the appropriateness of monetary targets largely amount to differences about policy activism, and conflicting positions on this issue can largely be interpreted in terms of the degree of adherence to a pre-announced target.

We took for granted the view that some form of monetary targeting is

necessary and discussed the theoretical and institutional problems associated with this policy, with emphasis on Canadian discussions of these problems. We first summarized the official position of the Bank of Canada on monetary control: in 1975, the Bank decided to control the growth rate of a narrow aggregate (M1), within plus or minus 2 percentage points, using an interest rate mechanism; the target was to be lowered gradually until the rate of inflation was reduced substantially. Then we discussed the selection of a control instrument (base or interest rate) in Canada. We described the two basic control procedures and reviewed the discussions on the selection of the most appropriate instrument in Canada.

Base control consists of changing the monetary base with the help of a forecast of the relevant multiplier. Its success depends largely on the ability to predict multipliers. We saw that each multiplier is determined by the portfolio behaviour of both the public and commercial banks and by required reserve ratios, which are fixed every ten years or so by the Bank Act of Canada. The predictability of multipliers is largely an empirical question. Interest rate control exploits the money demand equation. Using an estimated money demand and forecasts of prices and real income, the interest rate is pegged at a level consistent with the desired value of the money stock. We noted that this procedure amounts, in the end, to a special feedback rule, where the monetary base is changed to peg an interest rate. We pointed out that efficiency of interest rate control depends on characteristics of the money demand equation (fit, stability) and the predictability of variables appearing in the equation.

The selection of a control procedure is based on the controllability of the instrument, the closeness of the link between the instrument and the aggregate targeted, and the implications for other economic variables. Reviewing Canadian discussions of this topic, we saw that several economists, especially those associated with the Bank of Canada, argue that base control can lead to high volatility of interest rates or to a loose control of monetary aggregates because of the instrument instability problem and lagged-reserve accounting. Other economists, and especially monetarists, argue that the interest rate control mechanism is inefficient and may even lead to explosive oscillations in money and interest rates; they favour the base control mechanism, possibly with a number of institutional changes to make it more effective, such as a switch to contemporaneous reserve accounting, uniform reserve ratios, or penalty discount rates.

The selection of a monetary aggregate is based on its controllability, its link to ultimate targets, and the effect of this control on other variables in the system. We saw that the selection of a narrow aggregate (M1) was justified by the desire to minimize interest rate volatility (White 1979). Nevertheless, this choice was criticized because M1 may be more exposed to structural shifts than broader aggregates (Courchene 1981b).

In 1982 the Bank of Canada abandoned the control of M1, because financial innovations deprived this aggregate of its role as a reliable guide for policy (Freedman 1983).

We then reviewed the empirical literature that could help answer some of the questions raised earlier. We examined specifically the few studies on the control process in Canada, the extensive literature on money demand, and the literature on the relation between money, on the one hand, and real income, nominal income, and prices on the other hand.

The evidence on the controllability of aggregates is scarce and ambiguous. The evidence from reduced-form models suggests that monetary policy should aim at controlling inflation and should not be used as a stabilization instrument. Furthermore, the available evidence provides little support for the choice of M1 as the intermediate target. In general, broader aggregates appear more strongly related to the variables of interest.

Finally, we analyzed a number of options presently open to monetary policy. Not surprisingly, the options go from being more monetarist to being more Keynesian. The two poles were illustrated by a monetarist program recently stated by Milton Friedman and by the recent proposal of targeting nominal income proposed by Tobin and Gordon. Changing the aggregate controlled (including the recent proposal of using credit targets) and changing the control procedure were also discussed.

In view of the discussions and the empirical evidence surveyed above, we formulate the following conclusions and recommendations.

- The basic role of monetary policy is to anchor the price level; further, a predictable price level is preferable to an unpredictable one. There is little evidence suggesting that monetary policy can be usefully applied to a purpose other than the control of inflation in the longer run, or that discretionary variation in policy can add to economic stability in the shorter run. Given this role, the monetary authority must have a preoccupation with the growth of monetary aggregate(s). Though this does not necessarily lead to the adoption of a monetary rule, it seems that inflation control is difficult to realize without monetary targets. Pegging an interest rate or the exchange rate is, in general, incompatible with this goal. From this point of view, the recent abandonment of monetary targets by the Bank of Canada is not a situation that should last. Further, maintenance of a target requires a sufficient level of coordination with the fiscal authority; in particular, expenditures should be controlled to avoid a destabilizing growth of the deficit.
- If one accepts the view that monetary targets should play a prominent role in monetary policy, the selection of a monetary intermediate target is an important question. Recent experience and econometric evidence suggest that M1 is not a reliable guide for policy, especially if the basic purpose of monetary policy is to control inflation. Replacing

it by an alternative monetary aggregate, such as either the base or an aggregate broader than M1, should be examined very seriously. Clearly, research on this topic should be pursued.

- The selection of a control instrument is not an accessory choice. In particular, the adoption of base control, to replace the current interest rate procedure, should be considered much more seriously than it has been in the past. Empirical work on the controllability of monetary aggregates and the selection of a control instrument is scarce and especially needed.
- In view of improving the controllability of monetary aggregates, a number of institutional changes should be considered:
  - switching from lagged-reserve accounting to contemporaneous-reserve accounting or marginal-reserve accounting;
  - making the discount rate a penalty rate to discourage base changes through the discount window;
  - equalizing the reserve ratios on different types of deposits.These reforms may be especially important for base control, but they may also be useful for interest rate control. Of course, these changes become less important if the monetary base itself is adopted as the intermediate target, although they can still play a useful role by limiting loans through the discount window and by stabilizing monetary multipliers.
- If monetary targeting is adopted as a “rule” to avoid “political noise,” eschew “fine-tuning,” and transmit information to the public about the intentions of the Bank, the credibility, stability, and simplicity of the rule become important characteristics. Multiple targets (multiple aggregates, interest rates, exchange rate), wide bands for the target growth rate, and obscure policies in general should be avoided. In this perspective, the recent proposals of using credit aggregates jointly with monetary aggregates (B. Friedman) or adopting a nominal income target (Tobin, Gordon) leave a large amount of discretion and may lead to fine-tuning. It is difficult to view these proposals as playing the same role as a monetary rule. But in a framework where a discretionary monetary policy can improve the average performance of the economy, these suggestions may constitute interesting, though yet untested, strategies. Further research is clearly needed.

In our opinion, the above recommendations are well founded theoretically and supported to a large extent by the existing theoretical and empirical literature. Sure enough, the “flavour” of the recommendations reflects a monetarist view of the problems of monetary policy. However, many of these recommendations are supported by non-monetarists. For example, Lipsey (1981) in a recent “defence” of the Keynesian paradigm goes a long way toward the adoption of many of these suggestions. Moreover, in view of the scarcity of empirical results on many of the

issues involved, we wish to stress the importance of further research on the various problems associated with monetary control.

## Notes

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1. We note that a program of wage and price controls was adopted in conjunction with this new monetary policy stance.
2. Freedman (1983) describes the innovations that separated M1 from its informational content. Courchene considers that M1 was effectively abandoned as a target in 1981.
3. The Bank Act of 1967 set the reserve ratios to 12 percent for demand deposits and 4 percent for term deposits. The 1980 Bank Act reduced these figures to 10 and 3 percent, respectively.
4. This nomenclature restricts money definitions to bank liabilities. Other definitions of money could be obtained by including deposits in nonbank financial institutions such as trust companies and/or credit unions and caisses populaires. The control of the Bank of Canada over aggregates that include such deposits is more remote, since nonbank financial intermediaries are not under the jurisdiction of the Bank Act. The control of these aggregates should, however, be considered if this is necessary to attain the ultimate targets of monetary policy.
5. When pegging the exchange rate, the Bank may "sterilize" the effects of foreign exchange operations on the monetary base by, for example, replenishing or reducing bank reserves. In such cases, the Bank simultaneously performs two operations on the base that offset each other. It is easy to see that possibilities for "sterilization" remain limited by the level of foreign exchange reserves. In the longer run, domestic monetary policy and domestic inflation must be consistent with the maintenance of the exchange rate.
6. For this section, we draw abundantly from the survey of Lane (1983, chap. 2).
7. For an interesting discussion of the political economy of monetary policy, see Acheson and Chant (1972, 1973a, 1973b).
8. Kydland and Prescott (1977) also develop an argument in terms of the time inconsistency of "optimal policies" that leads to similar conclusions.
9. When  $M = Pm(r, y) = m(r, Py)$ , it is sufficient to predict nominal income  $Y = Py$ .
10. Open-market operations may consist of transactions with the general public (including banks) or with the government. In the latter case, purchase of securities from the government is a direct participation in financing the deficit of the government, and the high-powered money created is spent as part of government expenditures.
11. The dynamic problems associated with interest rate control are emphasized by Howitt and Laidler (1979), whose paper is discussed later. Under rational expectations, fixing interest rates can lead to price level indeterminacy (Sargent and Wallace, 1975). This indeterminacy may be solved by making the interest rate dependent on a desired money stock level (McCallum, 1981). In this case, the interest rate may need to be adjusted frequently and a great instability of interest rates and/or money and prices remains possible.
12. On this issue, some results based on money demands estimated with monthly data are reported by White (1976). They suggest that this phenomenon is possible. Statistical tests of the instability hypothesis are not reported, however.
13. Causality is defined following Granger (1969): variable  $X$  "causes" a variable  $Y$  if the past values of  $X$  help predict  $Y$ , given the past values of  $Y$ .
14. A reduced-form equation specifies the relationship between a particular variable and different exogenous variables, such as policy variables or predetermined variables.
15. Others have also worked on monetary multipliers and the determinants of money

- supply (see Fand and Tower, 1968; Hay, 1968; and Kelly, 1969). From the point of view of analyzing monetary control, their studies are of limited interest.
16. By stability of the relationship, we mean that the coefficients of the equation do not change over time.
  17. Other papers considered include Alexander (1981), Arango and Nadiri (1981), Breton (1968, 1970), Carr and Darby (1981), Château (1977, 1979a, 1979b), Clark (1973), K. Clinton (1974), Cockerline and Murray (1980, 1981a), Courchene and Kelly (1971), Daniel and Fried (1983), Donovan (1978), Fillion (1983), Goodhart (1969), Gregory (1981), Gregory and MacKinnon (1980), Gregory and McAleer (1981, 1983), Gregory and Raynauld (1983), Laffont and Garcia (1977), Laumas and Formuzis (1968), Laumas (1969), Laumas and Laumas (1969), Laumas and Zerbe (1971), MacKinnon and Milbourne (1981), Marothia and Phillips (1982), Miles (1978, 1982), Poloz (1979, 1980), Shearer (1970), Smith and Sparks (1970), White (1975, 1976),
  18. In such models money is decomposed as  $M = M^* + (M - M^*)$ , where  $M^*$  is anticipated and  $M - M^*$  is unanticipated. Only this latter portion can affect real output in the short run. To generate the anticipated portion, one relies on the rational expectations hypothesis, which states that expectations are best forecasts based on the available information; systematic errors are then excluded.
  19. The other countries are Germany, Italy, Japan, the United Kingdom and the United States. As well, Montmarquette and Forest (1979) have studied causality between money and the unemployment rate or the index of industrial production with Canadian monthly data. They find some effects of monetary innovations, which could be associated with unanticipated money, on real variables. Their results do not contradict the neutrality hypothesis.
  20. Inflation may lead to a reallocation of labour to “inflation-related” activities, such as price readjusting or forecasting. It can also blur relative price signals, increase search activity, and interact with the tax system in a nonneutral manner.
  21. The St. Louis equation relates the change in nominal income (or its rate of change) to changes of a monetary aggregate and a fiscal variable (budget surplus, government expenditures, etc.). Furthermore, in an open economy, the change in exports is generally added to the equation.
  22. The sample period and the specifications are not the same for the two authors: Duguay uses a rate of change specification of the St. Louis equation with data from 1957 to 1977, while Clinton has a “change in level” specification with data from 1953 to 1973.
  23. For an illustration of this problem, see Sargent and Wallace (1981). They consider a model of an economy that satisfies “monetarist” assumptions and show that *tighter* monetary policy now can lead to *higher* inflation in the future (in certain cases, immediately!). A crucial assumption to obtain this result is that “fiscal policy dominates monetary policy”: the fiscal authority first sets its budgets and deficits, and the monetary authority must buy the bonds that cannot be sold to the public, hence creating money and additional inflation. In such a case, the creation of high-powered money becomes endogenous, and there is no active monetary control.
  24. Some authors argue that bond financing of deficits may lead to instability; see Blinder and Solow (1976), Christ (1979), and Scarth (1980). In view of the procyclical behaviour of tax revenues, one way around this problem is to have a “flexible” monetary rule that lets money grow faster during budget deficit periods (recessions) and more slowly during budget surplus periods (expansions). Scarth (1982) argues that this is usually preferable to a “rigid” monetary rule where budgets are continuously balanced, even in a rational-expectations framework. A similar formula was even once advocated by Friedman (1948), though he apparently changed his mind afterward. Of course, such a flexible rule is, in principle, quite different from a discretionary monetary policy: the rule varies only over the cycle and the monetary growth rule should apply “on average.” But the application of the “rule” is more difficult to verify. Monetary growth depends (at least partially) on decisions by the fiscal authority: a potential source of discipline for the fiscal authority is relaxed, and the latter must by itself adopt policies that are consistent with a desired “average” growth rate of money. Clearly, difficulties that relate to the “credibility” of policies and “political noise” should be taken into account in assessing such “flexible rules.”

25. In October 1979, the Federal Reserve Board announced it was changing its operating procedure and would use nonborrowed reserves as operating tools for achieving control of the money supply. It is not clear, however, that this lasted for a long time. Friedman (1982, p. 109), for example, argues that "the Fed reverted briefly to a straight Federal Funds target in the Spring of 1980."
26. See Gilbert (1980); Judd and Scadding (1980); Laufenberg (1976); Laurent (1982); and Leroy (1979).
27. One alternative would be for the Bank of Canada to pay interest on reserves held by chartered banks. This could also be very controversial, given the structure of the banking system in Canada and the attitude of the public toward banks' profits.
28. Others who make a similar suggestion include Berkman (1980), Bryant (1983a, 1983b), and Friedman (1977).
29. Net final sales are defined as nominal GNP less inventory change. For the purposes of our discussion, this distinction is not important.
30. The policy studied by Bean (1983) seems akin to such a rule, though he is not clear on the degree of "fixity" of the "rule." In the same vein, McCallum (1984) suggests monitoring the base growth rate each month or quarter in view of maintaining a fixed growth rate of nominal GNP (three percent per year).
31. In theory, it is possible that "base velocity"  $Vh$  be more predictable (in some useful sense) than the money multiplier  $h$ . We have no evidence on that issue. However, to get a rough indication, let us define  $\bar{Vh}$ ,  $\bar{V}$  and  $\bar{h}$  to be the logarithms of  $Vh$ ,  $V$ , and  $h$ , respectively. Then we see easily that the variance of  $\bar{Vh}$  (possibly conditional on the relevant information) is

$$\text{Var}(\bar{Vh}) = \text{Var}(\bar{V}) + \text{Var}(\bar{h}) + 2 \text{Cov}(\bar{V}, \bar{h})$$

so that  $\text{Var}(\bar{Vh}) \geq \text{Var}(\bar{h})$  whenever  $\text{Cov}(\bar{V}, \bar{h}) \geq -\text{Var}(\bar{h})/2$ . Clearly, the latter condition is satisfied when shocks to  $V$  and  $h$  are positively correlated (as one would expect) or independent. If we use the variance as a criterion of predictability, under plausible conditions  $\bar{h}$  is more predictable than  $\bar{Vh}$ .

32. Bean (1983) gives conditions under which targeting nominal income would be preferable to targeting a monetary aggregate.

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# The Government Budget, the Accumulation of Capital, and Long-run Welfare

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## Introduction

This paper is concerned with two propositions that have motivated a virtual industry of research among public finance economists in the last decade. The National Bureau of Economic Research in the United States has supported much of this research, and the work of Martin Feldstein, his colleagues and students have been particularly influential.<sup>1</sup> These propositions are summarized in the points below.

- (i) The composition of the government budget has a sizeable impact on aggregate savings and hence on the level of capital intensity achieved in the long run in the economy. In particular, the structure of the tax system, the relative amounts of debt and tax finance, and the public pension system all affect the level of aggregate savings and investment in a significant way.
- (ii) Because of distortions that exist on capital markets, the long-run welfare loss from reductions in the capital stock are large, proportionately much larger than the losses that occur from distortions on other markets (such as labour or foreign exchange markets). By welfare loss we mean the reduction in per capita utility relative to what could have been achieved given the resources and technology available. In many instances, per capita utility can be approximated by per capita consumption.

The combination of these two propositions, if true, has dramatic consequences for the importance of policies that affect the incentive to save and invest. For example, Feldstein (1974b) argued in a seminal paper that the social security system in the United States could be resulting in an annual loss in GNP of as much as 15 percent.<sup>2</sup> Similarly, Summers's (1981) paper on

the effect of taxes on savings concluded that per capita welfare could be 12 percent higher in the long run if the government were to substitute consumption taxation for income taxation.<sup>3</sup> These sorts of numbers dwarf the estimates by Harberger (1966), which have stood the tests of time and refinement,<sup>4</sup> that the static welfare loss owing to the misallocation of capital sectors as a result of the corporation tax is less than 1 percent of GNP. Similar small estimates of the welfare loss owing to tariff distortions have been found in a static context.<sup>5</sup>

The quantitative estimates of Feldstein and Summers remain a matter of dispute. However, the mere possibility that the magnitude of the impact of capital market distortions on societal welfare could be so large, combined with the fact that policy tools could be instituted which could alleviate a good part of the distortion, makes this a subject worth considering carefully. The purpose of this paper is to survey the literature on which the two propositions given above are based. Though the literature has been around for some time, it has yet to become part of the conventional wisdom of economic policy. Indeed, many economists are probably not aware of the fundamental results of this literature, partly because it is based on an abstract and technical aspect of the growth theory of the 1960s and 1970s whose relevance for policy is only now being discovered.

We proceed by considering the above propositions in reverse order. To understand how the composition of the government budget might impinge on societal welfare through its impact on the economy's long-run capital intensity, we must first recognize the welfare implications of changes in the capital stock. The following section, on the relevance of capital intensity for economic welfare, attempts to outline the long-term importance of the capital-labour ratio for societal welfare. This allows us to identify a source of welfare loss in a growing economy, whose presence is a critical determinant of the magnitude of the welfare losses estimated by Summers and others. The section on the effect of the government budget on capital formation discusses the impact of the various components of the government budget on the capital intensity, and hence welfare level, of the economy. Since much of the literature has been developed with the U.S. economy in mind, we shall have to be careful about drawing policy implications in Canada. In particular, some of the conclusions drawn in the literature might have to be tempered by the fact that the rate of return on savings and investment in our capital markets may be essentially dictated by work markets; that is, Canada's economy may be a small, open economy.

## **The Relevance of Capital Intensity for Economic Welfare**

A consideration of the relevance of capital market distortions for economic welfare necessarily involves looking at the economy from a

dynamic point of view. That, in turn, requires stipulating a time horizon in which to compare alternative dynamic paths that the economy may follow. For the purposes of this paper, we will adopt mainly a long-run perspective where our concern will be with the effects of policy on economic development into the indefinite future. Hence, our policy choices will be constrained to those which can be maintained indefinitely. We begin by reviewing some of the simple lessons about long-run possibilities that have been taught by growth theory.

A convenient concept for characterizing the long-run development of the economy is the steady-state growth path, which corresponds to a rate of growth of GNP that could be maintained indefinitely. The growth of GNP is ultimately constrained by the rate of growth of inputs into production (i.e., labour and capital) and by the rate of increase in the productivity of those inputs. The former is dictated by the rate of growth of labour supply, which is usually assumed to be exogenous, the latter is determined by the rate of technological progress, which is also assumed exogenous.<sup>6</sup> The growth of the capital stock, which is determined by economic decisions, must ultimately accommodate itself to the rates of growth of labour and technological progress. For if the rate of growth of the capital stock were to exceed the rate of increase of labour supply and its productivity, this excess would imply a continually decreasing rate of return on capital, and vice versa. The natural growth rate, the sum of the rates of growth of the labour supply and technological progress, represents the rate at which the economy could grow indefinitely. In the steady state, output grows at the natural growth rate, and the ratio of capital to the effective supply of labour (what we shall refer to simply as the capital-labour ratio) is constant, as are the rate of return on capital and the wage paid for effective labour. The effective labour supply is a measure of the labour supply in terms of efficiency units, where the efficiency units associated with a worker grow at the rate of technological progress.

There is a considerable literature on the existence of steady states and on whether or not the economy tends toward such a state.<sup>7</sup> Following most of the dynamic policy analysis that we are reviewing, we simply assume that in the long run the economy does tend toward the steady state. The steady state should be viewed as an analytical tool for understanding the dynamic forces at work and should not be taken literally as a state that the economy does eventually reach. Indeed, if the economy is out of the steady state, it only approaches the steady state gradually over time. Moreover, the steady state that the economy approaches may vary over time as, for example, occurs if the rates of growth of labour or technological progress change. The fact that much of the analysis of dynamic economies has taken place in the context of economies in, or moving toward, steady states reflects the analytical difficulty of dynamic analysis. Nonetheless, the insights that have been gained from the

analysis of steady state tendencies are, we think, more generally applicable.

The natural growth rate determines only the rate at which GNP may grow in the long run. It does not stipulate the level of GNP along the growth path. In fact, many steady-state growth paths are potentially possible, each one associated with a different level of capital intensity. Given the growth of the labour supply, a steady state with a higher capital-labour ratio will have a higher level of GNP. However, at the same time, more of this GNP will have to be devoted to investment, as opposed to consumption, so that the higher capital intensity supporting it can be maintained. Thus, consumption and individual welfare may or may not be higher in steady states with higher levels of capital intensity and GNP. Since there exists a potential capital intensity that would yield the optimal growth path, an understanding of what determines capital intensity is important. The capital intensity that would be attained in the steady state is determined by the operation of capital markets. The supply of savings by households and the demand for savings by firms jointly determine the capital intensity and rate of return on capital in the steady state. The capital intensity in the steady state can thus be influenced by changes in the willingness of households to save, and changes in the incentives for firms to invest.

This paper is primarily concerned with the influence of government policy on aggregate savings (and hence on capital intensity and welfare) in the long run. Not only does the tax structure influence household savings, but also the government may influence the equilibrium capital stock attained in capital markets by creating non-capital assets which substitute in household portfolios for the real capital of the private sector. These assets include government debt and social security wealth (public pensions). Therefore we want to investigate how the composition of the government budget — that is, tax structure and the levels of government debt and social security — affects capital intensity and individual welfare.

While most of our discussion concerns the effects of policy on long-run capital formation, it is important to recognize that it may take considerable time for the economy to adjust to structural changes and reach its new steady state. The nature of the gains and losses occurring during the transition from one steady state to another may well differ significantly from those in the new steady state. For example, if the structural change involves moving to a permanently higher capital intensity, capital accumulation must occur at a higher rate during the transition than in the eventual new steady state. This will cause a loss for those persons alive during part of the transition, followed by a long-run gain for all subsequent generations. If the transaction requires several years to accomplish, as has typically been found to be the case,<sup>8</sup> the period during which the loss occurs could be considerable. The nature of the

costs and benefits which occur during the transition period is something we shall discuss when we consider the impact of policy in the long run.

Before considering the ways in which elements of the budget affect the capital stock in the long run, we begin by discussing the welfare significance of the level of the capital stock in a growing economy. In the literature, two sources of welfare loss can be distinguished which result in markets supplying the “wrong” amount of capital. The first is the conventional inefficiency arising out of the divergence between the gross rate of return to investment and the net rate of return to savers as, for example, in the case of tax distortions. The second is a more subtle source of welfare loss referred to as dynamic welfare loss, which reflects a divergence between the rate of return on investment and the rate at which consumption can be reallocated over time through intergenerational transfers.

### *Conventional Inefficiency in Capital Markets Owing to Distortions*

The conventional notion of inefficiency in capital markets arises when there is a distortion between the gross rate of return on capital investment and the net return to saving. For example, if the marginal rate of return to investment before tax exceeds the return to saving after tax, then the amount of future consumption that society could acquire by foregoing present consumption exceeds the amount of future consumption required to compensate households for foregoing present consumption. That is, it would be potentially possible for all households to be made better off by increasing investment. In that sense, the capital stock in our example is inefficiently low.

There are three commonly cited sources of market imperfection which give rise to a gap between the rate of return to investment and the net rate of return to savings:

- (i) **Tax Distortions.** The various sorts of taxes on capital income impose a wedge between the before-tax return on investment and the after-tax return on savings. These taxes include the personal income tax on capital income (interest, dividends and capital gains) and on business income, the corporate tax, resource taxes and the property tax. In Canada, personal taxes are close to zero for many types of capital income or for many individuals because of the various ways that savings can be sheltered or that capital income can be tax-exempt. Savings for retirement in the form of RRSPs, RPPs and DPSPs are sheltered, which implies that the capital income earned on them escapes personal taxation.<sup>9</sup> Savings for the purchase of housing done through RHOSPs are also sheltered. Capital income which is exempt at the personal level includes the

first \$1000 of interest, dividends and taxable capital gains, the first \$1000 of pension income for those over 65, and the imputed rent on housing and other consumer durables. In addition, capital gains are taxed at half rates, although this could be viewed partly as a crude method of integrating the personal tax on capital gains with the corporate tax system. The personal tax on business income only represents a distortion to the extent that the deductions allowed for costs do not cover the full imputed costs of all inputs, encouraging the use of those inputs whose costs are fully deductible relative to those whose costs are not.

Similarly, the corporate tax will impose a distortion on the investment decision of corporations to the extent that the costs that can be deducted for tax purposes are not equivalent to the true economic costs of operating the corporation. It is well known that if the present value of all deductions for costs, including current costs, depreciation, interest costs and inventory costs, is less than the cost of inputs as measured on a cash-flow basis, the tax will discourage the purchase of inputs; and vice versa. If the present value of deductions does equal the cash-flow cost of inputs, the corporate tax will not affect marginal investment decisions. It will be a tax on the pure profits of firms and therefore will not be distorting. It is not obvious a priori whether or not the corporate tax imposes a distortion at the margin on corporate investment and, if so, whether the distortion acts to encourage or discourage investment. It depends on the generosity of the deductions for interest and depreciation. The same applies for taxes on resource revenues.

Some empirical evidence exists concerning the magnitude of the distortion imposed by the corporate and personal tax systems on the non-resource sectors of the Canadian economy. Boadway, Bruce and Mintz (1984) calculated the difference between the before-tax real rate of return on investment and the after-tax real rate of return to savers on an aggregate basis for each year from 1967 to 1978 and for four types of capital goods — machinery, buildings, land and inventories. They found that in post-tax-reform years (1972–78) the effective marginal tax rate, the ratio of this difference to the gross rate of return to investment, was about 28 percent for machinery, 49 percent for buildings, 36 percent for land, and 68 percent for inventories. These rates can be disaggregated into a proportion due to the corporate tax and a proportion due to the personal tax. Personal taxes accounted for about 58 percent of the total distortion. In that study, the after-tax real rate of return on savings was estimated to be about 2.7 percent. Similar calculations have been done by the Department of Finance, and roughly the same results were obtained. There have been no comparable calculations done for the resource industries taking into account the

special tax advantages there, though effective tax rates on investment would probably be somewhat lower in these industries. Neither the property tax nor indirect taxes have been included in such calculations, so the figures may be underestimated.

- (ii) **Capital Market Imperfections.** If there were perfect capital markets and no taxes, the discount rate for everyone would equal the market interest rate. The rate of return on savings might differ from the rate at which households were willing to substitute future for present consumption if constraints existed on their ability to borrow freely against future income to finance current consumption. If these constraints were binding so that the household was unable to reach its desired consumption level in the current period, the household discount rate would exceed the market interest rate. Households would be forced to do more saving (less dissaving) than desired, and capital accumulation would be higher than otherwise. This would tend to offset the distortion of the first sort imposed by the tax system.
- (iii) **Intergenerational Externalities.** The third distortion is one that has figured prominently in the literature on the social discount rate; that is, the rate of discount that the government should use for its intertemporal decisions. It has been argued by Sen (1961) and Marglin (1963) that there is an externality involved in the act of saving for future generations which results in households saving too little from an efficiency point of view. The argument is that each member of the present generation benefits not only from personal consumption but also from the consumption levels of members of the succeeding generation, both direct heirs and those of their contemporaries. Thus, saving for future generations has an externality associated with it. When any one person decides how much to leave as a bequest for future generations, he or she calculates only the benefit personally received from the bequest and ignores the benefit that other members of the same generation receive from that same bequest. The result is that the level of savings is inefficiently low. The rate at which the current generation collectively would be willing to forego present consumption to increase the consumption of future generations exceeds the rate at which individuals would do so privately.

Related to this point are issues concerning capital market failure based on intergenerational equity rather than efficiency. For example, if we subscribe to a classical utilitarian social welfare function (which treats increases in individual welfare as giving rise to the same increase in societal welfare no matter who the individual is) applied across generations as well as within, the rate at which we would want to discount present versus future generations, consumption (the social discount

rate) would depend upon the rate of growth of consumption and the rate at which the marginal utility of each generation falls with increases in consumption. If utility functions of all generations are identical for purposes of social welfare comparisons and if we simply add individual utilities to obtain social welfare as is done under classical utilitarianism, the social discount rate from a social welfare point of view is the rate of growth of consumption multiplied by the elasticity of the marginal utility of consumption.<sup>10</sup> Using this sort of calculation, Feldstein (1977a) has suggested that the social discount rate may be in the order of 7 percent.

These sources of distortion involving capital market imperfections and intergenerational externalities differ from tax distortions in that they are inherently difficult to measure; unlike tax distortions, no market prices can be used to deduce their magnitude. For that reason it is difficult to appeal to them as a basis for hard policy prescriptions. Feldstein (1977a) has suggested a rough estimate of the magnitude of the distortion in the United States between the rate of return on investment and either the rate of return on savings or the rate of discount on utilitarian grounds. He suggests that the gross real rate of return on investment is about 12 percent, while the net real rate of return to saving is 5 percent, as compared with his estimate of the social discount rate mentioned above of 7 percent. In Canada, effective tax-rate calculations suggest a gross real rate of return to investment of about 6 percent and a rate of return to savings of 2.7 percent for the period 1972–78 (see Boadway, Bruce and Mintz, 1984).

### *Dynamic Welfare Loss and the Golden Rule*

This second sort of welfare loss can arise even in an economy with perfectly functioning capital markets. It can most simply be explained in the context of steady states. As mentioned earlier, in general there are several different steady states possible for an economy with a given production technology, rate of technological change, and rate of growth of the labour supply. The steady states will differ in their capital intensities even though all will have the same rate of growth of capital and GNP. Steady states with higher capital-labour ratios will have higher GNPs, but they will also require a larger amount of their GNP to be devoted to investment in order to maintain the higher level of capital intensity at the given rate of growth. The question for welfare purposes is whether or not the amount of the higher GNP left over for consumption will be higher or lower given the higher required level of investment. The fundamental insight from growth theory is that the steady state which maximizes per capita consumption indefinitely is the steady state along which the rate of return on investment just equals the rate of growth of GNP. The prescription that the rate of return on investment ( $r$ ) should equal the rate of growth of GNP ( $n$ ) is referred to as the Golden Rule for

capital accumulation.<sup>11</sup> If  $r > n$ , there is said to be an underaccumulation of capital in the sense that if the capital-labour ratio were higher, per capita consumption would be higher in the steady state. Conversely, if  $r < n$ , there is an overaccumulation of capital; a lower capital stock would increase per capita consumption in the steady state. Whenever  $r$  is not equal to  $n$ , there is said to be dynamic welfare loss in the sense that there would be another steady state in which everyone would be better off than the steady state the economy is in at present.

It should be emphasized that these are long-run results. They compare per capita consumption and hence utility levels in two steady states. An attempt to move from one steady state at which  $r > n$  to one with a higher capital intensity would necessarily make some persons worse off during the transition. Thus, the policy maker would have to weigh the long-run gain from increasing the capital intensity (which would accrue to all future generations) to the short-run loss suffered by those generations alive when the transition is instituted. Conversely, if  $n > r$  so capital is overaccumulated, a transition to a new steady state with less capital intensity can be accomplished with no one being made worse off. In this case, there is said to be dynamic inefficiency.

The capital-labour ratio that is eventually achieved by capital markets need not be that of the Golden Rule steady state. It depends on the long-run demand for investment and on the aggregate supply of savings. It may also depend on the behaviour of the public sector in ways to be discussed in the section outlining the effect of the government budget on capital formation. The fact that competitive capital markets may lead to a situation in which per capita utilities are not being maximized implies that there must be potential long-run gains which, for some reason, are not being exploited. It is instructive to inquire into the nature of these potential gains.

One way to look at this source of welfare loss is as follows. Present consumption can be transformed into future consumption through investment at the rate  $(1 + r)$ . At the same time, present consumption can be transformed into future consumption through "intergenerational transfers" at the rate  $(1 + n)$ . To understand this latter point, imagine a steady state in which the government levies a tax on the incomes of the younger generation and concurrently transfers the proceeds to the currently alive older generation. This is like an unfunded public pension system. To any person, the implicit rate of return of such a scheme over his lifetime is  $n$ , the rate at which GNP and thus the tax base is growing. The fact that there is a divergence between the rate at which present consumption can be converted into future consumption by different means implies that there may be gains from trade which have not been exploited. The difficulty is that there is no private market for the latter sort of intergenerational transfer. Such schemes can apparently only be instituted by the government.

To see the way in which the use of intergenerational transfers can be welfare improving, imagine an economy in a steady state in which  $n > r$ . If the government institutes the above scheme of transfers in such an economy, everyone can be made better off indefinitely.<sup>12</sup> In the short run, the older generations obtain a windfall gain since they receive the proceeds of the tax payments collected from the young and some of the unborn without having contributed to the scheme over their entire working years. In the long run, everyone is better off since the tax-transfer contract is equivalent to acquiring an asset when young, which yields a rate of return  $n$ , and consuming the proceeds in retirement. This asset will substitute for owning real capital, which will only yield a rate of return  $r$ , and where the stock of capital will decline. Conversely, if  $r > n$ , the institution of such a scheme, though providing a windfall gain to the current older generation, would make all future generations worse off owing to the fall in capital intensity. In the section on the effect of the government budget on capital formation we shall see a variety of other ways in which the government, through its budget, can affect intergenerational contracts and influence the accumulation of capital.

To improve long-run welfare in the case in which  $r > n$ , what is required is an intergenerational contract which involves redistributing income in the opposite direction to that above; that is, from each generation to its successor. For example, the government could tax the older cohorts in each period and transfer the proceeds to the younger cohorts. In the long run, this would be equivalent to allowing each person to borrow when young at the interest rate  $n$ . Since  $n < r$ , the proceeds can be invested at a higher rate of return, and the household is better off. The capital stock of the economy will have risen. Contrary to the previous case, during the transition to the new steady state, the older cohorts alive when the tax was instituted would be made worse off. There would therefore be a short-run loss to be weighed against the long-run gain. An example of this sort of intergenerational transfer in practice might be public education.

Before turning to some of the policy implications of dynamic welfare loss, it is worth mentioning a complicating factor. It concerns the fact that the economy may be open in the sense that the rate of return in capital markets may be determined by world capital markets. If this is the case, the rate of return on capital  $r$  would effectively be predetermined by that rate prevailing in world markets. Again, there is no reason why  $r$  should be equal to  $n$ , the rate of domestic growth. If it is not, there would seem to be an opportunity to exploit the divergence between  $r$  and  $n$  by a system of government transfers which influence the net demand for foreign assets by domestic residents. Thus, if  $r < n$ , the scheme which taxes the young and transfers the proceeds to the old would induce households to substitute out of foreign assets in favour of the implicit pact with the next generation, thereby making them better off.

To summarize this section, if the economy is on a steady-state growth

path in which the rate of growth of GNP ( $n$ ) equals the rate of return on investment or on foreign assets ( $r$ ), the economy is said to be in the Golden Rule steady state in the sense that per capita consumption is maximized. If  $n > r$ , there is an overaccumulation of capital and the economy is dynamically inefficient. A lowering of the stock of capital, which could be achieved by an ongoing set of transfers from one generation to the preceding one, can make all generations better off indefinitely. This is subject to the proviso that we are willing to conceive of such a scheme going on indefinitely; if not, when the scheme eventually terminates, the older generations at the time suffer a loss. If  $r > n$ , there is an underaccumulation of capital in the sense that the long-run level of welfare could be higher with a higher capital intensity. In this case, the policy which would increase the capital stock must necessarily make some generations worse off in the short run in order to make all others better off in the long run. As an example, policies that induce higher capital intensities involve an ongoing transfer from each generation to its successor. For those alive at the time such a policy is instituted, a welfare loss must be incurred since the generation from whom they would receive a transfer is no longer alive. Thus, the policy maker must necessarily weigh the long-run gains from increasing capital intensities with the short-run losses.

It is also instructive to consider the converse of the above. Suppose the economy is in the Golden Rule steady state. A short-sighted policy maker could institute a policy of running down the capital stock, thereby making current generations better off at the expense of all future ones. The difficulty is that, even though the future losses may exceed the current gains, there is no mechanism by which future generations can prevent such action from being taken.

We shall now consider policies that the government might undertake to change the capital intensity of the economy. These policies may be of two fundamental sorts. First, they may simply remove inefficient distortions on capital markets. Second, they may effect a change in the capital stock by transferring income across generations. Here, policies which increase the capital stock will involve a continual transfer from each generation to its successor, and those which reduce the capital stock involve a continual transfer from each generation to its predecessor.

## **The Effect of the Government Budget on Capital Formation**

### ***The Long-run Budget Constraint of the Government***

This paper is primarily concerned with the long-run implications of alternative government budget stances. We begin by discussing the sorts of budget policies that can be sustained over the long run. We can think of the budget as comprising four sorts of policy instruments — govern-

ment spending, taxes, transfers and debt.<sup>13</sup> Our concern is with the long-run movement of economic aggregates (saving, capital formation, per capita consumption) rather than with disaggregated effects. That being the case, the most interesting sorts of transfers are those which involve the redistribution of purchasing power from one generation or age cohort to another rather than among persons of different income within the same age cohort. Consequently, by transfers we shall mean intergenerational transfers, referred to here as social security since this is the most prominent, though not by any means the only, form of explicit intergenerational transfer. Purely intragenerational transfers (those occurring within a particular generation rather than between members of successive ones) will simply be thought of as negative taxes. Various taxes can also be distinguished by their intergenerational impact. For example, a tax on consumption will fall relatively more heavily on the old compared with a tax on wages. Because of the intergenerational impact of the various components of the government budgets, it is misleading, as Kotlikoff (1984) has pointed out, to think of the conventional budget deficit as measuring the creation of future government liabilities, or to think of the size of the debt as a measure of the stock of government liabilities. We should equally well include, for example, the present value of future tax receipts less transfer liabilities. This value could be positive or negative, depending on the timing of the transfers relative to that of the tax receipts and on the demographic composition of the population. For example, under an unfunded social security system (discussed below), the net liabilities outstanding are positive in that the currently alive generations expect future benefits in excess of future tax liabilities while, for all future generations, expected benefits will be covered by expected tax contributions as long as the scheme lasts.

Budget policy consists of choosing the levels of government expenditures, taxes, social security and debt issue. At any given time, any three of these issues can be determined independently, the fourth being determined by the requirement to meet the budget constraint for that year. Once long-run factors are introduced, there is an additional constraint that might be considered. The government cannot continue to create net liabilities endlessly since the stock of debt would become indefinitely large. That is to say, the government faces a long-run budget constraint which requires that the present value of all future government transfers and expenditures, including debt retirement, discounted at the market interest rate, must equal the present value of all future tax receipts and new debt issues.<sup>14</sup> This present-value calculation is made into the indefinite future (i.e., to infinity).

This guideline still leaves a great deal of scope for the government to change its budget policies over time. For example, it could run up the size of the debt for a period of time and then later run it down. Such a policy would transfer purchasing power to the generations alive while

the debt is being run up, at the expense of the generations alive while the debt is being paid off. The interim generations could be better or worse off depending on the relationship between the level of debt and per capita consumption. To avoid these sequences of redistribution across generations, we will be primarily concerned with long-run budget policies which are compatible with steady-state growth paths. In this case, the major redistributions that occur among generations will occur during the transition from one steady state to another as long-run policies change.

The characterization of budget policies that are consistent with steady-state growth may be found in Diamond (1965), Phelps and Shell (1969), and Atkinson and Stiglitz (1980). Basically what is required is that the per capita levels of government expenditures and government debt as well as the rate of tax and transfer remain constant. Many steady states are possible, each one corresponding to different values of per capita spending and debt and different tax rates compatible with long-run budget balance. The analysis below will be restricted to a consideration of alternative ways of financing a given level of government expenditures; thus, per capita government expenditures will be taken as exogenous, leaving social security, debt issue and taxes to be determined by the government. For example, a higher level of per capita debt in the steady state will imply a higher rate of tax. This framework will be used to study the capital intensity and welfare implications of the composition of the government budget.

### *Aggregate Savings Behaviour*

In order to appreciate the impact of taxes, social security and public debt on aggregate savings and capital formation, it is worth summarizing the theory of savings behaviour that has been prominent in most of the literature in this area: the life-cycle theory of savings, with or without bequests. The essence of this theory is that the household is free to choose any lifetime stream of consumption subject only to the requirement that the present value of consumption and bequests equals the present value of lifetime earnings and inheritances. The fundamental behavioural prediction of this model is that the consumption undertaken by a household in any given period is a certain proportion of the household's total wealth, where total wealth includes both the present value of future labour earnings (so-called human wealth<sup>15</sup>) and accumulated asset wealth. The propensity to consume out of wealth rises with age, and it varies with the rate of interest, although in an unpredictable fashion.

This theory is useful in analyzing the consequences of budget policy changes. Most budget changes will impact on a given age cohort in one of two ways, or both. First, they may affect the wealth of the household by changing the stream of future earnings, as in the case of a change in

the income or payroll tax rate or a change in the social security transfer rate. At the time such changes are undertaken, a larger proportion of the wealth change will impact on consumption and a smaller proportion on savings, in relation to the increasing age of the person considered. Second, they may affect the rate at which households discount future consumption and income, as would be the case with a change in the rate of tax on capital income. An increase in the discount rate has two effects: it changes the propensity to consume out of wealth, although in an ambiguous direction; and it reduces the present value of future earnings. This latter, referred to as the human-wealth effect by Summers (1981), will reduce a household's consumption and increase its savings.

Summers (1981) has argued that earlier empirical studies of savings behaviour based on the life-cycle model underestimate the interest elasticity of savings by ignoring the human-wealth effect. By entering the interest rate and wealth as separate arguments in savings (or consumption) regressions, the wealth variable was picking up changes in savings which ought to have been attributed to interest-rate changes. Boskin (1978) found an interest elasticity of 0.4 using this method. On the basis of steady-state simulations, Summers argued that the long-run interest elasticity of aggregate savings was in the range of 1.9 to 3.4. As with any simulation, the results depend on the parameters used, and subsequent contributors have shown Summers's results to be sensitive to his assumptions (see Evans, 1983; and Starrett, 1983). Summers (1982) has recently attempted, with some success, to substantiate his simulation results with an empirical analysis using U.S. data. His aggregate consumption function estimates incorporating the human-wealth effect yielded savings elasticities in the order of 1.3. A similar study for Canada by West (1984) found a savings elasticity of 0.25.

It should be noted that Summers's further inquiry into the subject led him to conclude that attempts to use standard consumption functions as vehicles for examining the interest sensitivity of savings are plagued with problems. To circumvent these difficulties, Summers presented elasticity results based on an effort to estimate directly the parameters of the utility function of the representative consumer. They indicate that savings are very responsive to changes in real after-tax rates of return. While the findings are not quite as dramatic as his earlier ones, the direct estimation of utility function parameters suggests an interest elasticity of savings greater than equity. With both models used by Summers, each based on quite different simplifying assumptions, yielding similar results, he concludes that the rate of return effects on savings are both substantively and statistically significant.

Empirical studies typically estimate the short-run response of savings to tax or other changes. From a long-run point of view, what is important is not so much the initial response of various age cohorts to budget changes, but changes in asset demands over the life cycle. If a tax change

induces a household to hold more assets on average over the life cycle, the aggregate demand for assets in the long run can be expected to be higher. From a household's perspective, an important consideration is the timing of the tax liabilities. Taking as given the amount of revenue the government must collect at a point in time, the later in the life cycle of households the timing of the tax liabilities, the greater the level of savings earlier in life and hence the greater the average asset demand over the life cycle. This timing effect of tax payments turns out to be critical in evaluating the long-run effects of alternative tax policies. If the long-run budget stance is such that the government collects revenues later in the life cycle of each taxpayer, aggregate savings will be higher. To use the terminology of our earlier discussion, the long-run net liability position of the government budget will be lower the more taxes are expected to be paid later in life. The reduction in the net liabilities of the government owing to the fact that tax revenues are collected later in the life of all age cohorts works to offset the effect of the increase in net liabilities induced by increases in government debt (the proceeds of which are required to finance government expenditures given the delay in tax receipts). Of course, to move the long-run budget stance to one in which tax liabilities are incurred later in life would involve a loss during the transition period to members of the older generation who now are liable for a tax they had not expected. In effect, a change in tax bases which changes the timing of tax liabilities in the life cycle is implicitly the same as an intergenerational transfer similar to the unfunded public pension discussed earlier. All our discussion of long-run tax changes assumes that such changes are unanticipated.

### *The Effect of Debt on the Capital Stock*

Consider first the long-run effect of debt policy on the capital stock. As Phelps and Shell (1969) have shown, steady states with higher public debt per capita might be expected to have lower capital-labour ratios, though the crowding out of private capital by public debt may not be one for one.<sup>16</sup> The reason for this crowding out is readily apparent when we examine the role of capital and public debt in an overlapping generations model. The equilibrium capital stock is determined in capital markets by the demand and supply of capital assets. The demand for these assets comes from households who use them as a means of accumulating wealth for the purposes of converting their lumpy household income streams into a smooth consumption stream. In effect, according to the life-cycle hypothesis and given the usual pattern of earnings, households accumulate assets during the first part of their lives, and sell them off gradually in the latter part to finance consumption. In the absence of public debt, real capital serves as the vehicle for satisfying household asset demands. Young cohorts continually purchase assets from the

older retired cohorts. In this way, the capital stock serves as a vehicle for transmitting wealth across generations. Once public debt is introduced, another vehicle exists which can satisfy household asset demands. Therefore, less real capital will be demanded, and society's capital stock will decline.

The issuing of public debt can also be viewed as the instituting of an ongoing system of intergenerational transfers, analogous both to unfunded public pensions and to the advancing in time of tax liabilities (as when a payroll tax is substituted for a consumption tax). Once the debt is in place, its maintenance requires an ongoing transfer from the younger generations (who purchase the debt) to the older generations (who sell it).

The story must be modified slightly in an open economy since foreign assets must be considered. If the open economy is small, the foreign assets' rate of return dictates the domestic interest rate and, therefore, determines the capital stock independently of domestic savings decisions. In the steady state, domestic demands for assets will depend on the given rate of return. Any difference between the domestic demand for assets and the domestic supply of them (real capital or government debt) will be met by holding foreign assets. In this case, a steady state with a higher level of public debt will have a higher level of foreign indebtedness, and vice versa.

From a welfare point of view, whether or not an increase in public debt per capita is beneficial in the long run depends on the level of capital intensity relative to the Golden Rule level. If the rate of return on capital  $r$  exceeds the rate of growth of GNP  $n$ , a higher level of public debt per capita, which lowers the capital-labour ratio in the long run, will move the economy further away from the optimal steady state and reduce per capita consumption. Society would be better served by reducing the level of public debt per capita. The opposite is true for the case in which  $n > r$ , so that there is already too much capital accumulation from a long-run point of view.

These are long-run welfare implications. During the transition the gains or losses may go in opposite directions to the long-run result. For example, suppose that  $r > n$ , so capital is underaccumulated. An increase in the level of public debt, holding government expenditures constant, must provide a welfare gain to the other cohorts alive when the increase is made. Their tax payments will fall, and the tax payments of subsequent generations will rise. Thus, during the transition there will be a windfall gain to the current older generations which must be weighed against a loss to all subsequent generations. Once the new steady state is reached, the higher level of public debt is equivalent to an ongoing tax on the younger cohorts accompanied by a transfer to the older cohorts with an implicit rate of return of  $r$ .<sup>17</sup> Thus, the issue of public debt is analogous to an increase in the level of social security. Both involve a windfall

gain to the current older cohorts and an ongoing intergenerational transfer which reduces the capital stock. The difference between the two is that the implicit rate of return on social security is only  $n$ , while that on public debt is  $r$ .

The quantitative importance of the effect of debt policy on capital formation depends on aggregate household savings behaviour and, in particular, on the importance of bequests. At one extreme, if households were to leave no bequests and were to consume all their lifetime earnings, the crowding out of private capital (or foreign assets) by public debt would be close to one for one.<sup>18</sup> The debt would be a perfect substitute for private capital except for the wealth effect arising if  $r$  does not equal  $n$ . At the other extreme, if all households gave bequests for altruistic reasons, there would be no effect on the demand for private capital if the government attempted to move to a higher level of debt per capita. If all households were choosing their bequests optimally to begin with, so that the division of wealth between themselves and future generations was optimal from their point of view, any windfall gains which would tend to be generated by an increase in public debt would not be spent by the current generation. Instead, the gains would be passed on to future generations entirely in the form of bequests. Parents would make up for the heavier taxes in store for their heirs by providing a larger bequest. Thus, current savings would increase by the full amount of the public debt, and the private demand for real capital (or foreign assets) would remain unchanged. Public debt would only have an effect insofar as the servicing of the debt required distortionary taxes to be raised. Neither public debt nor social security could be used to alter the capital stock to make  $r = n$ .

This offsetting of the effects of public debt by bequests is referred to as the Ricardian Equivalence Theorem and has recently been popularized by Barro (1974). He questioned both Modigliani's (1961) argument that an increase in government debt would increase desired consumption relative to saving and Feldstein's (1974b) argument that social security would do the same. Modigliani's thesis hinged on the assumption that an increase in government debt leads to an increase in net wealth as perceived by the private sector. While many recognized that the future taxes required to finance the interest payments on the debt would offset somewhat the direct positive wealth effect of debt issue, it was Barro who formalized the argument. He argued that government bonds would be perceived as net wealth by the private sector only if their value exceeded the capitalized value of the implied stream of future tax liabilities. Moreover, within the context of an overlapping generations' economy with physical capital and finite-lived individuals, Barro derived a key result — with an operative intergenerational transfer (bequest) there is no wealth effect and hence no effect on aggregate demand from an incremental change in government debt (or social

security). This result did not require current generations to weigh the utility or consumption of future generations on an equal basis with their own consumption, or directly to weigh that of any future generation other than the immediate one. The crucial consideration for this result is a chain of operative intergenerational transfers which allows current generations to act as though they were, in effect, immortal.

In essence, this analysis suggests that if individuals have finite optimization horizons and are selfish, then government debt (and social security) will substitute for private savings; whereas, if generations are linked by intergenerational transfers motivated by altruism to immediate heirs, changes in the stock of government debt can be exactly offset by an appropriate adjustment to these transfers. In the former case, aggregate capital accumulation is reduced. In the latter, where the intertemporal budget constraint is left unaffected, there is no impact on capital accumulation, consumption or welfare.

The extent to which households offset the effects of public debt by increasing bequests is obviously of critical importance in assessing the long-run effects of debt policy. There are two sorts of evidence which may be relevant here. First, there is evidence concerning the extent to which households do, in fact, save for bequests. The evidence suggests that a considerable amount of saving takes the form of intergenerational transfers. In Canada, taxation statistics seem to imply that households accumulate assets during their working lives which they do not completely consume in retirement. Dicks-Mireaux and King (1982) examined the behaviour of wealth holdings over the life cycle, using cross-sectional data on Canadian families in 1977, and investigated its dependence on provisions for pensions and social security. Their findings suggest that while the “hump-shaped” pattern for wealth holdings, consistent with the life-cycle model of savings, is in fact observed, the rate at which wealth declines after retirement is less than would be predicted by a life-cycle model without bequests. They therefore conclude that the evidence is consistent with a significant bequest motive.

Similarly, in a U.S. study, Kotlikoff and Summers (1981) stress the necessity of distinguishing between the roles of life-cycle savings and intergenerational transfers in the capital accumulation process. Their work leads them to conclude that the life-cycle hypothesis (e.g., Ando and Modigliani, 1963) is not supported by the observed lifetime consumption and earnings profiles in the United States and that only a negligible fraction of actual capital accumulation can be traced to life-cycle or “hump” savings. Intergenerational transfers appear to account for the vast majority of U.S. capital formation. Of course, the mere existence of bequests or even their magnitude does not imply that the Ricardian Equivalence Theorem holds. The motives for the bequests could include more than altruistic behaviour. For example, their existence may reflect imperfections in the market for annuities, or the

inability to take reverse mortgages on houses in a manner which insures against length of life.

Recent empirical work has attempted to test more directly the responsiveness of savings and consumption to government debt. Testing the theory empirically has proven to be less straightforward than first thought. Carmichael (1984) contends that the dominant effect of both social security and government debt, if non-neutral, is captured in asset demand functions. Early tests, however, were based almost exclusively on estimated aggregate consumption functions. He argues that this procedure biases the result in favour of neutrality. Direct estimation of an aggregate capital accumulation equation led him to conclude that the past issue of public debt and the existing social security system have together reduced the capital stock in the United States by around 40 percent.

Reid (1982) has tested the Ricardian theorem for Canada. In one test he focusses upon the causal relationship between government debt and economic activity (rather than estimating an aggregate consumption function). To the extent that the evidence indicates that changes in government debt cause a change in the level of economic activity, this would suggest that the Ricardian Equivalence Theorem does not describe private sector behaviour. The empirical evidence generated by this investigation detected and justified causality, supporting the position that public debt is a component of net wealth and that changes in it influence behaviour.

As outlined above, whether or not government debt is net wealth depends critically on the ability of the private sector to foresee and capitalize accurately the value of the stream of future tax liabilities implied by the issue of government debt. Reid (1983) has attempted another test of the neutrality proposition within a framework in which the private sector possesses limited information about the future path of output and fiscal policy. The results here indicate that at least the anticipated portion of the deficit flow influences consumption demand, rejecting again the strict debt neutrality propositions of the Ricardian Equivalence Theorem. Specifically, Reid concludes that only approximately 65 percent of future tax liabilities associated with deficit flows are discounted by the private sector. This degree of future tax discounting is considerably less than that revealed by Feldstein's (1982a) empirical analysis for the United States, which found levels of discounting as high as 90 percent.

### *The Effect of Social Security on the Capital Stock*

Public pension schemes can take two different forms. They can be fully funded, in which case individual contributions to the scheme are placed in capital markets where they will yield the market rate of return. The

accumulated stock is then drawn from by the contributor in his retirement years. Alternatively, they can be unfunded, in which case all current benefits are financed out of current contributions so there is no "asset" corresponding to the net liabilities of the scheme. An unfunded scheme is referred to as a Pay-Go scheme. Unless a public pension scheme is fully funded, any partially funded scheme will eventually run out of funds and become a Pay-Go scheme; in the long run, therefore, it only makes sense to distinguish between a funded and an unfunded public pension scheme. The fact that a scheme is only partly funded at a given time implies that the government has decided (implicitly or otherwise) to phase in an unfunded scheme over a longer period of time than necessary.

In the case of a fully funded public pension scheme, there is no particular reason why it should have any effect on the rate of savings and asset accumulation. Provided an individual's contributions in present value terms equal his future benefits, the pension will be a perfect substitute for private savings. In practice, there are several reasons why actual funded pensions may not be perfect substitutes. If the government does not make the funds freely available to capital markets, the pension may be only an imperfect substitute for private savings and may lead to a decline in aggregate capital accumulation. For example, in Canada the funds are lent to provincial governments. If this practice induces these governments to increase their expenditures, some private capital formation (or acquisition of foreign assets) could be crowded out (see Jump, 1984 and Jump and Wilson, 1985). Also, contributions to the public pension scheme could amount to forced saving and result in an increase in the capital stock or an increase in the net demand for foreign assets. Furthermore, the public pension would not be equivalent to private saving if it induced households to vary their retirement behaviour. For example, as Burbidge (1982) has pointed out, the premiums and benefits of the scheme may be set such that the scheme is actuarially fair in the aggregate but, from the point of view of any one individual, the benefits upon retirement and premiums paid in working years are given. In this case, individuals may be induced to retire early since, from their point of view, the opportunity cost of retiring is reduced. If so, they will tend to save more during their shortened working lives to provide for their longer retirement. Finally, the government may decide to use the pension funds at least partly to retire public debt. If so, we would view the policy as a combination of a public pension scheme and a change in public debt. The effect of the latter has been discussed above.

In fact, public pensions in Canada, as in the United States, are unfunded in the long run. This fact alone creates severe strains within a public pension system, strains which will become more acute as the baby-boom population retires and the worker-to-retiree ratio falls. In such a situation, workers must be forced to contribute more to the

system, benefits must fall, or some combination of these alternatives has to occur. As recognized from the inception of the Canada Pension Plan/Quebec Pension Plan (CPP/QPP) system, a considerable increase in contributions is inevitable. For example, Hamilton and Whalley (1984) calculate that the combined employer/employee contribution rate must rise in Canada from the present 3.6 percent level up to around 10 percent by the year 2030. This projection reveals a fundamental problem with a Pay-Go public pension scheme — with successive generations of different sizes, some degree of intergenerational inequity is inevitable.

For policy purposes, it is the effect of unfunded public pensions that is relevant. There is an extensive literature, mostly applied to the United States, concerning the effects of unfunded public pensions on capital formation and welfare. The seminal piece was that of Feldstein (1974b), and we begin by reviewing his arguments although there has been considerable controversy concerning the magnitudes of the effects he purported to have found.

The impact of social security on savings and capital formation can be put in its starkest form by supposing that all households save according to the life-cycle hypothesis, have a fixed labour supply and retirement age, and plan to leave no bequests. Let us imagine an economy in the steady state consisting of a series of overlapping generations or cohorts of varying ages. (We return to the transition from one steady state to another below.) With an unfunded social security system in place, payroll taxes are levied on the current working generation to finance transfers to the currently retired. There are various ways of viewing this social security system. From the point of view of the overlapping generations' growing economy, the social security system is a continuous system of redistributive transfers from each generation to the preceding older generation. It thus represents a mechanism for redistributing consumption across time and generations. From the point of view of the government budget, as pointed out by Kotlikoff (1984), social security can be seen as a net liability to the government at each point of time, since the current older generations expect future benefits from the scheme in excess of their future tax liabilities while all subsequent generations expect benefits in retirement in return for the payment of taxes during their working life. Given this implicit contract with the government, at any time after the system has been introduced the present value of future benefits less taxes to the current population will be negative to the government. Finally, from the point of view of the representative individual, the social security system is equivalent to the acquisition of an implicit asset during his working life whose value will be gradually run down over his retirement years through its conversion to purchasing power.

According to the individual perspective, the asset being acquired has an implicit rate of return  $n$  (the natural growth rate), assuming the

household expects the benefits to be received with certainty. If  $r = n$ , the asset would be a perfect substitute for private savings, and the latter would fall by the full amount of the payroll tax contribution. If  $r > n$ , as seems to be the case today, the household's lifetime wealth is reduced by the social security system relative to the sum which would have accrued had the savings been invested in the capital market. Payroll taxes would be less than a perfect substitute for private savings; savings would fall by less than the contribution.

The reduced savings would, in a closed economy, be reflected entirely by a fall in the capital stock in the long run. This is so since the funds collected by the government are transferred to the retired to finance their consumption, rather than invested in the capital market as the savings they replace would have been. In other words, households would on average demand fewer assets from the private sector, and the capital stock would fall. With the supply of funds into the capital market reduced, there would be a rise in  $r$  which would dampen the fall in savings in general equilibrium. Nonetheless, the fall in capital stock could be substantial. If  $r > n$ , there is already an underaccumulation of capital, and welfare would fall in the long run, the more so the larger is ( $r$  minus  $n$ ).

In an open economy, the reduction in the demand for capital assets would be reflected in part by a fall in foreign asset holdings, which also yield a rate of return  $r$ . In this case, if  $r$  is exogenous to the economy (as it could be in a small open economy such as Canada's), the fall in savings is not dampened by a rise in  $r$ , and the full effect of the substitution of social security for private savings would be felt.

These are long-run results since they compare steady states with and without social security. While it is true that, according to the above scenario, the capital-labour ratio and per capita consumption could fall significantly in the long run, there could nevertheless be short-run gains during the transition period. For example, if a Pay-Go social security system is introduced into a steady state without social security, the older cohorts alive at the time would receive a windfall gain equal to the payroll tax revenues collected and redistributed. In the absence of bequests, these gains would eventually be consumed, and the economy would adjust to a lower capital-labour ratio. In judging the scheme, it would be necessary to weigh these benefits to the older age cohorts with the long-run losses suffered by all future generations as a result of the lower capital stock. Of course, if the scheme were eventually terminated, a further windfall loss would result for those alive at the time of the termination. This loss would be followed by a long-run gain in per capita welfare.

The assumptions used in the above discussion lead to an unambiguous decline in savings and capital formation (or foreign asset holdings) in response to Pay-Go social security. Under alternative assumptions

about savings behaviour, the magnitude of the decline in savings can vary considerably. There are three sorts of reasons found in the literature as to why savings may not decline by as much as the above arguments would suggest, if at all. First, if retirement is variable, because Pay-Go social security reduces the “price” of retirement, individuals may be induced to retire earlier. If so, as mentioned already, more savings would be required during a shorter working life to finance the longer period of retirement. On theoretical grounds, the net effect of social security and induced earlier retirement on savings is ambiguous.<sup>19</sup>

Second, persons may not view the social security benefits as certain since there is no asset associated with them, and the scheme could be changed by the government at any time. As Townley (1981) explains, if the government thinks itself answerable to the voting population alive at the time when a pension plan decision is made, it may not use an infinite planning horizon. Instead, it may employ a decision rule that reflects the shorter planning horizon favoured by the current citizens. Faced with this dilemma, individuals may in general regard their future benefit stream as anything but certain. If households are not sure whether retirement benefits really will be available for them in accordance with the existing provisions, they may not view contributions as a substitute for retirement savings and may not reduce savings much in response to the social security system.

Third, once bequests are considered, the impact of social security on saving and capital formation could be considerably lessened. If we adopt the extreme Ricardian Equivalence view as discussed by Barro (1974), the effect of social security would be nullified entirely by a change in bequest behaviour. According to this view and as discussed above, the quantity of bequests given by the current generation is determined by their degree of concern for the succeeding one. Bequests are planned such that the marginal benefit to themselves from additional consumption equals the marginal benefit from the bequest to their heirs. In turn, these heirs would determine their bequests according to the utility they received from their heirs, and so on through generations. If the government tried to redistribute consumption across generations by introducing a system of Pay-Go social security, the windfall accruing to the first generation would be passed on to the subsequent generation by way of an increased bequest, and so on with all succeeding generations. In this super-rational world, the Pay-Go scheme would have no effect on capital formation and consumption levels at all. This is, of course, an extreme view of the way in which bequests are determined. However, as long as some of the windfall gains are passed along to future generations in the form of bequests, at least part of the effect of the public pension on savings would be dampened.

Given these various conflicting tendencies, the effect of social security on savings behaviour is ultimately an empirical question. Feldstein

(1974b) recognized this problem and attempted to estimate the impact on aggregate consumption and savings of the social security system in the United States. To do so, he estimated an aggregate consumption function using annual data for the years 1929–71 excluding the war years 1941–46. The dependent variables in the regression were disposable income (current and lagged), retained earnings (to reflect savings on behalf of households by the private sector), private sector wealth (lagged), and social security wealth. Social security wealth was defined as the present value of expected future social security benefits.<sup>20</sup> The regression indicated that the level of social security wealth had a significant positive influence on the level of aggregate consumption. On the basis of this regression, Feldstein calculated that if social security wealth were zero in 1971, all other variables being constant, savings would have been \$61 billion higher, the capital stock would have been 60 percent higher, and GNP would have been 11–15 percent higher.

Support for Feldstein's findings is found in Munnell (1976), whose estimates showed a substitute relationship between private savings and social security coverage as well, confirming Feldstein's result. Her framework of analysis, like Feldstein's, was a time-series study in which a social security wealth variable was added to the Ando-Modigliani consumption function (i.e., consumption is a function of private wealth and disposable income). While her estimates are generally more conservative than Feldstein's, they nevertheless confirm his results. When classified by age, income and net worth, individuals not covered by pensions had greater private assets than those expecting benefits. In response to critics, Feldstein (1979) re-estimated his aggregate consumption equation using different (net) retained earnings and household wealth variables. The results were consistent with his earlier findings. These results run counter to the reasoning found in a previously popular view, based on a cross-sectional study by Katona (1965), that private pension benefits stimulate saving by providing a base upon which to build toward an adequate retirement income.

Leimer and Lesnoy (1982) presented evidence that shed considerable doubt on Feldstein's conclusions. They pointed out that the social security wealth variable he used was incorrect as a result of a computer programming error and that the estimated social security/savings relationship was sensitive to the period of estimation considered. Using Feldstein's specification of the consumption function, the revised time-series evidence they examined rejected the claim that personal savings had been substantially reduced. When Feldstein (1982b) responded to this by re-estimating the aggregate consumption relationship using an updated data set, he found that personal saving was reduced by 43 percent, re-confirming his earlier results.

In Canada, Feldstein-type estimates were performed by Boyle and Murray (1979). Their time-series model attempted to determine the net

impact of the Canada Pension Plan (CPP) and Old Age Security (OAS) on household savings, using a standard Ando-Modigliani specification augmented by a social security wealth variable. Their results suggested that Canada's public pension plans have had no visible effect on household savings behaviour.

Jones and Williamson (1983) have recently argued that it is very doubtful that aggregate time-series regressions can provide any insight into the determination of the impact of public pensions on private saving, wealth and capital accumulation. They show that the social security wealth measure is incapable of capturing the effects of the changes introduced by the scheme, such as new wealth creation, retirement age adjustment, and the alteration of bequest levels. That is, the impact of social security is not isolated in the coefficient on the social security wealth measure, but instead affects all the consumption function coefficients. Furthermore, they show that changes in the interest rate or life expectancy parameters can influence the relationship between social security wealth and other variables even when there is no change in the social security system. Hence, estimates reported in the literature are subject to errors of functional form, errors which help to explain the contradictory empirical results.

Regardless of the accuracy of Feldstein's original or revised estimates, there is still a difficulty in using them alone to deduce the long-run effects of social security on the capital stock, GNP and welfare. In the long run, the independent variables in the aggregate consumption function are endogenous. The stock of private wealth, disposable income and retained earnings are all influenced by the capital stock either directly or through the general equilibrium effects of the economy. Thus, to simulate the long-run impact of the social security system on the economy we would need to know more than just the aggregate consumption function; we would need to have a model of the growing economy as a whole. In an attempt to obtain such a model, Beach, Boadway and Gibbons (1984) estimated Feldstein's consumption function with social security wealth as part of a simple five-equation general equilibrium representation of a single-sector growing economy using the revised data of Feldstein (1982b). On the basis of simulations using the estimated model, they found that the U.S. social security system, which was introduced in 1929, caused the capital stock to be 5 percent less in 1981 than it would have been in its absence. This is much less than the 40 percent fall estimated by Feldstein, the difference arising because of the effects of feedbacks through the general equilibrium system. No equivalent estimates have been performed for Canada (partly because of the lack of a reliable data series for private sector wealth).

The alternative to estimating a system of equations which represents the dynamic path of the entire economy is to construct a simulation model to trace the long-run development of the economy under different

assumptions regarding its underlying behavioural relations and structure. One such exercise has been done by Kotlikoff (1979). His life-cycle overlapping generations' model with its retirement effects suggests a 20 percent decline in the capital stock in the long-run general equilibrium, with a substantially greater partial equilibrium decline.

Most of the empirical and simulation results mentioned above have indicated that the capital-labour ratio would fall in the long run in response to the introduction of a Pay-Go public pension. In some cases, the fall is dramatic. The welfare consequences of the fall in capital intensity are not apparent a priori. They are not captured, for example, in changes in GNP, although this is what Feldstein (1974b) drew attention to in his seminal article. Lower levels of GNP as a result of lower capital-labour ratios do not necessarily imply lower levels of consumption per capita as mentioned earlier. A smaller proportion of the GNP needs to be devoted to investment, leaving a larger proportion for consumption. As discussed above in the section on the relevance of capital intensity for economic welfare, a fall in the capital-labour ratio will reduce long-run welfare if  $r > n$ . No calculations of the magnitude of the welfare effects have accompanied the literature on the positive effects of social security. In the next section on the effect of taxation on saving and capital accumulation, we shall discuss the simulations of welfare effects done in the context of capital-labour ratio changes in responses to tax changes. Similar results would apply to social-security-induced changes in capital intensity. The presumption is that  $r$  exceeds  $n$  by a considerable amount, so that welfare would be expected to decline significantly with a fall in the capital stock. Feldstein (1977a) has presented some rudimentary evidence on this proposition. He outlines how we might calculate the welfare loss associated with an increase in social security and the subsequent decrease in private saving. Since social security "pays" an implicit rate of return  $n$ , and since one dollar's worth of taxes would have earned a rate of return  $r$  had the money been invested in real capital, then an individual loses  $(r \text{ minus } n)$  dollars during the "retirement" year per dollar of tax paid in the previous "working" year. The discounted social value of that loss at the time that the tax is paid is thus  $(r \text{ minus } n)/(1+d)$  where  $d$  is the social discount rate. Using his figures for  $r$ ,  $n$  and  $d$ , as discussed above, this loss amounts to \$.065 on every dollar of payroll tax contributed.

### *The Effect of Taxation on Saving and Capital Accumulation*

The study of the impact of taxes on capital markets has long been a major preoccupation of public finance economists. It has, most importantly, formed the core of traditional tax incidence analysis which has been mainly concerned with the effect of taxes on the functional distribution of income (i.e., the share of output going to capital and labour).<sup>21</sup> Much

of the earlier work on the dynamic effects of taxes involved extending the static incidence analysis to a growth setting. The main impact of these efforts was to show that the long-run incidence of capital taxes could differ significantly from the short-run incidence. For example, the substitution of a capital income tax for a payroll tax could reduce capital owners' income relative to wage earnings by as much as the full amount of the tax in the short run. However, in the long run, labour could end up being worse off as capital owners respond to the tax change by reducing the capital stock relative to that of labour, increasing the rate of return on capital and decreasing the wage rate. Much of the dynamic incidence literature has been variations on that theme.<sup>22</sup>

Our interest is not so much in the incidence effects of taxes in the long run, but in the long-run effects of taxes on the welfare of the economy, or on the level of per capita consumption. That is, we are interested in the size of the pie in the long run, rather than in how the pie is divided up. The literature we are reviewing ignores differences in the incomes and endowments of persons of the same age cohort, thereby assuming away the atemporal incidence question. In principle, there could be an intergenerational incidence issue, since per capita utility can rise over time owing to technological progress. Thus, we might be concerned with the distribution of utility over time under various tax systems. To evaluate such differences, we would require an intergenerational social welfare function. We concentrate mainly on long-run issues involving steady-state comparisons. In such analyses, comparisons are between two steady states in which the per capita utility in one is higher than in the other for all persons. However, once transitions between steady states are taken into account, there will often be gaining and losing cohorts during the transition from one tax regime to another. An intergenerational social welfare function would be useful in evaluating these changes.

The literature has been developed almost entirely in the context of a closed economy. It involves investigating what effect tax changes will have on the long-run capital-labour ratio and hence on welfare. The taxes considered are personal taxes, which primarily affect private incentive to save, and corporate taxes, which affect a firm's incentive to invest. The overall effect of tax changes involves analyzing the way in which capital markets adjust to such changes. To concentrate on tax effects, the analyses involve substituting one tax system for another in such a way as to keep total tax revenues constant. If the economy were a small open one, like Canada's, the savings and investment sides of capital markets would effectively be segmented. Personal taxes on capital income would affect aggregate savings and ultimately the net holdings of foreign assets, while taxes on business income would affect the level of investment and the capital stock without affecting its after-business tax rate of return (see Boadway and Bruce, 1982).

We focus here on the effect of taxation on savings, as opposed to its

impact on investment, since most of the recent literature related to our discussion has concentrated on the savings decision. The key long-run effects of substituting one tax system for another on aggregate savings are captured in Summers's 1981 paper. Summers simulates the long-run effects of two sorts of tax substitutions in a simple single-sector neo-classical steady-state growth model with continuously overlapping generations. In one experiment, he substitutes a proportional wage (payroll) tax for the existing system of taxes on wage and capital income; in the other, he substitutes a consumption tax for the same existing system. All households are assumed to have the same preferences and to supply the same amount of fixed labour. They save according to the life-cycle hypothesis outlined in the section on the relevance of capital intensity for economic welfare, receiving no inheritances and leaving no bequests. Parameter values are chosen so as to replicate the stylized facts of the economy. Existing tax rates are taken to be 20 percent on wage income and 50 percent on capital income, the latter figure reflecting both the personal and corporate tax systems. The gross rate of return on capital is 11 percent, the after-tax rate of return on savings is 6.0 percent, and the natural growth rate of the economy is 3.5 percent (1.5 percent owing to population growth and 2 percent to technological progress).

The substitution of a wage tax for the existing system causes GNP to rise by 14 percent, per capita consumption to rise by 14.2 percent, and an index of lifetime utility to rise 5 percent. The corresponding results for the consumption tax are an 18 percent rise in GNP, 17 percent rise in per capita consumption and a 12 percent rise in lifetime utility. Both substitutions cause the capital-output ratio to rise. Indeed, the capital-output ratio rises by almost 75 percent in the consumption tax solution. Furthermore, since the wage tax would raise welfare by 5 percent, while the consumption tax would raise welfare by about 12 percent, when these figures are applied to American aggregates they yield huge annual flows — about \$80 billion in the former case and approximately \$200 billion in the latter. These are startlingly large numbers. They force one to ask why they are so large and why they are larger for the consumption tax than for the wage tax.

The reasons for the size of the welfare changes are apparent given the discussion above on the relevance of capital intensity. Since the rate of return on investment is considerably larger than the natural growth rate (11 percent as compared to 3.5 percent), the original steady state is characterized by dynamic welfare loss resulting from an underaccumulation of capital. There is also a capital market distortion of the conventional sort owing to the large tax on capital income. The move to either a payroll tax or a consumption tax removes this distortion, and thus increases savings and the capital-labour ratio. The large welfare gain comes mainly from the increase in the capital stock which moves the economy closer to the Golden Rule. This is substantiated by the fact

that the welfare change is so much higher under a consumption tax than under the wage tax. Under both of these taxes, the capital market distortion is removed, but the induced increase in the capital stock is much larger under the consumption tax. To account for the increase in the capital stock and the differential effect on savings under the two tax regimes, it is necessary to look more closely at the effect of the two taxes on savings.

Consider the wage tax first. The substitution of a wage tax for an income tax removes the distortion on saving (since capital income is no longer taxed) and reduces the relative price of future consumption. As the life-cycle savings theory outlined earlier suggests, this has two effects. First, the increase in the net rate of return on savings has an ambiguous effect on the propensity to consume out of wealth. A household will want to consume more in the future owing to the fall in the relative price of future consumption, but it may or may not take more savings to finance this higher level of future consumption. Second, the rise in the net return on savings reduces the present value of future earnings. This so-called human-wealth effect induces households unambiguously to increase their current savings. But since the first effect has an ambiguous impact on savings, the overall impact is ambiguous as well. Summers argues on the basis of a variety of simulations that, for reasonable parameter values, the long-run elasticity of aggregate savings with respect to the interest rate will be large and positive (in the range of 1.9 to 3.4 percent). It is this large interest elasticity of savings which accounts for the rise in savings when the wage tax is introduced and the net return to savings increases. This results in a higher capital-labour ratio after capital markets have adjusted.

The consumption tax also benefits from the large interest elasticity of savings in the sense that the substitution of this tax for an income tax increases the net return on savings and, given the market response of savings to interest-rate changes, results in a larger capital stock. However, that cannot account for the entire story since the savings response, as indicated above, is so much higher under the consumption tax than under the wage tax. To account for the larger impact of the consumption tax on savings, the difference in the timing of the tax collections must be recognized. From the point of view of the representative household, consumption-tax revenues are collected relatively later in the life cycle than wage-tax revenues (or than income-tax revenues). Wages are earned only during an individual's working life while consumption expenditures are made both in the working and retirement years. This postponement of tax liabilities implies that households will save more earlier in life given their larger after-tax incomes and the requirement to pay taxes later in life. Thus, more capital assets will be demanded, and the equilibrium level of these assets will rise. From the point of view of the government budget, the use of the consumption tax as opposed to the

wage tax implies that the present discounted value of net liabilities of the government will always be lower under the consumption tax since tax collections occur further off in time. Relative to a wage tax, the move to a consumption tax involves a redistribution of income from each generation to the succeeding one — just the opposite of a Pay-Go social security system or an increase in government debt. The implied higher equilibrium capital stock owing to this timing effect causes the capital-labour ratio, and hence welfare, to rise, given the dynamic welfare loss resulting from the under-accumulation of capital associated with the original steady state.

The tax collection timing effect actually works against the wage tax (with respect to its stimulative power on savings) when it is substituted for an income tax, since the wage tax is collected only during the working part of the life cycle. The fact that aggregate savings rise despite this timing disadvantage is evidence of the magnitude of the interest elasticity of savings in the long run. Relative to the income tax, the wage tax transfers income from one generation to the preceding one. The substitution of a wage tax for an income tax is thus like the institution of Pay-Go social security in that regard. The importance of the different direction in which the intergenerational transfer works under these various taxes will become apparent when we consider the transition from one tax scheme to another.

Summers's 1981 paper, not surprisingly, has generated considerable controversy. Since his results are based on simulations, the exact results depend upon the structure of the model and the parameters chosen. Thus the main concern over conclusions drawn is how sensitive the qualitative results are to the particular assumptions built into the model. Investigative work continues to be done in this area. Here we merely draw attention to some of the important assumptions in Summers's model which could have a qualitative impact on his results, and consider some of the work that has been done to test these assumptions.

Summers's model takes the labour supply to be fixed, and implicitly ignores the tax distortions imposed by wage and consumption taxes. Omitting this source of distortion implies an overestimate of the benefits of implementing these taxes. The lack of bequests in the model is obviously unrealistic since evidence exists which shows that bequests could account for a large proportion of aggregate capital accumulation (see Kotlikoff and Summers, 1981). However, the effect on savings of introducing bequests could go either way or perhaps be negligible. Under the extreme Ricardian Equivalence assumption, any attempt by the government to change capital formation by tax changes would be virtually undone by bequest adjustments; but as we have seen, the empirical evidence supporting the Ricardian Equivalence hypothesis is not strong. Furthermore, if bequests are motivated by a simple utility-of-bequests function, the existence of capital income taxation increases the

“price” of bequests and may therefore discriminate against saving for them. Simulations by Seidman (1983) introduce bequests into the utility function and show that the qualitative results of Summers’s model are not affected much by them.

The wage profile used by Summers is unrealistic and exaggerates the human-wealth effect, thereby increasing the interest elasticity of savings. Wages are assumed to rise exponentially with time rather than exhibiting the usual hump shape associated with the life-cycle savings hypothesis. This tends to depict earnings as accruing relatively later in life than is actually the case. Also, the tax rate on capital income is assumed by Summers to be 50 percent. Recent studies of effective tax rates cited earlier indicate that this figure may be an overestimate. If so, the difference between  $r$  and  $n$  might be less, as would be the scale of the associated dynamic welfare loss.

Although some sensitivity analysis was done by Summers, it was not done with all of the relevant parameters. Evans (1983) recomputed Summers’s results using alternative assumptions about the pure rate of time preference and the natural rate of growth and found that the results depend on the magnitude of these sorts of parameters. Similarly, Starrett (1983) found that the magnitude of the long-run interest elasticity of savings depends on the form of the utility function.

Perhaps the most revealing elaboration of Summers’s work was done by Auerbach, Kotlikoff and Skinner (1983) who, in addition to incorporating variable labour supply and endogenous retirement behaviour (rather than assuming a fixed labour supply as did Summers), also explicitly computed the transition path from one tax regime to another. Furthermore, they allowed for progressive as well as proportional income taxes. Once movements between steady states are considered, matters complicate quickly because all price variables and taxes will change interdependently over time. Since households base their current decisions on the future paths of earnings, interest rates and taxes, some view must be taken of expectations. Auerbach et al. assume the extreme case of perfect foresight and period-by-period budget balance.

In the Auerbach, et al. paper, two sorts of simulations are performed, involving the substitution of a wage tax and a consumption tax for a pre-existing income tax so as to yield the same tax revenues in each period. In the case in which proportional taxes are used, the results are as follows. The substitution of a proportional wage tax for a 30 percent income tax causes per capita utility to rise for the older generations alive at the time of the tax change owing to the windfall gain they receive when taxes that would have been due on capital income under the income tax are eliminated. Over time, per capita utility by cohort gradually falls until in the long run, contrary to Summers’s findings, per capita utility is lower than under the income tax by 4 percent. This occurs despite a rise in the capital-labour ratio. The fact that this long-run result differs from

that of Summers is largely due to the variability of the labour supply. Sensitivity analysis shows that long-run welfare can be made to rise if the labour supply is made more inelastic — that is, less sensitive to wage-rate changes (recall that labour supply is perfectly inelastic, or fixed, in Summers's model). The wage tax is especially discriminating against labour supply because not only is it levied directly on labour earnings, but also its rate is high (in contrast with, say, the consumption tax) at the time in the life cycle when labour is being supplied. The short-run gains during the transition reflect the fact that the switch from income to wage taxation provides a windfall gain to older generations who no longer have to pay taxes in retirement. This illustrates the importance of the timing of tax payments. During the transition when the short-run gains are made, consumption rises, and the capital-labour ratio falls; but, eventually, the capital stock is rebuilt as the long-run interest elasticity of savings takes effect, leaving a higher capital-labour ratio in the final long-run equilibrium. Introducing progressivity here, as in all cases considered, simply magnifies the effect of the changes.

The substitution of a proportional consumption tax for the income tax results in virtually mirror-image results. In this case, welfare initially declines for the older cohorts since for this group the base of the consumption tax is far greater than that of the income tax, and then welfare rises for all subsequent cohorts. In the long run, per capita welfare is higher by some 6 percent. This smaller long-run welfare improvement, as compared with Summers's example, can be attributed partly to the variable labour supply, partly to a different age-earnings profile (which reduces the interest elasticity of savings), and partly to the lower tax rate of 30 percent on capital income in the initial equilibrium. The transition results reflect a windfall loss to the older generation owing to the fact that their consumption now is being taxed in retirement. In judging the desirability of the tax substitution, the long-run gains enjoyed by succeeding generations would have to be set against the short-run losses incurred by the generation retired at the time of the change.

The windfall or wealth effect resulting from a tax substitution is a phenomenon which economists have been aware of in other contexts. As Kotlikoff (1984) discusses, any tax substitution which has differential effects by age cohort will have a windfall wealth effect on existing cohorts. For example, in an influential paper, Feldstein (1977b) showed how a tax on land, previously considered perfectly neutral, imposes a windfall tax on the older generations in favour of future generations, causing savings and capital accumulation to rise. Similarly, as Bradford (1981) shows, a tax on corporations can have a windfall effect on existing shareholders via its effect in share values.

The windfall effect is particularly pronounced in Auerbach et al. because of the abrupt way in which the tax substitution is introduced.

When a consumption tax is introduced, all future consumption is taxed regardless of whether or not it is financed out of income which has been previously taxed. As such, there is considerable retroactivity in the tax. In practice, this is not the most likely way that such a tax would be introduced. Under most consumption-tax systems advocated, households would have a choice between treating savings on a so-called designated basis, which is like taxing consumer expenditures as they occur, or on a non-designated basis, which is like exempting capital income from taxation, as with a wage tax (see Boadway and Bruce, 1985). During the transition, the older generations would likely opt for the latter, and the windfall loss associated with the introduction of a consumption tax would be largely avoided. In other words, the transition would combine a consumption tax and a wage tax and as a result move all cohorts more smoothly to a higher level of welfare.

The task that still remains for economists is to put more empirical substance on the savings response to tax changes. What the existing simulations show is the size of the potential gains that could possibly be obtained from tax changes. In open economies, the impact of these changes is likely to be even larger since there are no dampening effects of a reduction in  $r$  as the capital stock rises.

## Conclusion

This paper has been concerned with the effects of the government budget on capital formation and welfare. We have identified two broad ways in which government policy could stimulate capital formation. The first is to eliminate distortions in the capital markets by, for example, removing or lowering taxes on capital income. The removal of such distortions eliminates a source of inefficiency and is capable of making everyone better off, subject to the usual reservations about second-best policy changes. However, most studies of the gain in welfare from eliminating such distortions have indicated that the magnitude of these gains is likely to be relatively small.

The second general way the government can affect capital formation is by altering the long-run net liability position of the government budget. At any given point in time, the net liability position of the government will be influenced by the long-run policy stance adopted. We considered three similar ways in which government policy influenced the net liability position. An increase in public debt, the institution of an unfunded social security scheme, and a tax reform which advances tax liabilities to an earlier part of taxpayers' life cycle all increase the long-run net liability position of the government budget and discourage capital formation. A convenient way to characterize these policy changes is to regard them as implicit transfers from each generation to its predecessor. The long-run effect of each of these schemes is to reduce the capital stock of the

**TABLE 6-1 Long-run Policy Prescriptions under Various Conditions**

	$r > n$	$r = n$	$r < n$
Unfunded Social Security	reduce	leave unchanged	increase
Public Debt	reduce	leave unchanged	increase
Tax Policy	tax later in life cycle	leave unchanged	tax earlier in life cycle

*Note:* This table assumes that the Ricardian Equivalence Theorem does not hold, so bequests are not fully operative. With fully operative bequests, none of the above policy prescriptions apply.

economy. Conversely, policy changes which reduce the net liability position of the budget induce a higher level of capital intensity in the long run.

The long-run effects of changes in capital intensity on welfare depend on the relation between  $r$  and  $n$ . If  $r > n$ , an increase in capital intensity increases per capita welfare in the long run, while if  $r < n$ , welfare will fall. Since the professional consensus seems to be that  $r > n$ , that is the relevant case to consider for policy purposes. Simulation analysis tends to indicate that the long-run welfare gains from increasing the capital stock arising from differences between  $r$  and  $n$  are much larger than those calculated from eliminating ordinary market distortions.

Table 6-1 summarizes the policy options available to the government to increase welfare in the long run by exploiting differences between  $r$  and  $n$ . When  $r > n$ , budget policies which increase the capital stock (or the net holding of foreign assets) are appropriate, for example, those policy stances which involve a reduction in the net liabilities of the government such as reducing unfunded public pensions, moving to a tax on consumption, or reducing public debt. When  $r < n$ , the opposite policies are called for. Of course, if the Ricardian Equivalence Theorem applies, none of these policies will be effective since bequest behaviour would undo any attempt by the government to redistribute income across generations. Such evidence as exists does not support the theorem in its extreme form.

The fact that an increase in capital intensity can lead to a long-run gain in per capita welfare does not imply that the case for reducing the net liability position of the government (by reducing public debt, eliminating unfunded public pensions, or substituting consumption taxation for the existing system) is clear cut. The long-run gains can only be achieved at the expense of short-run costs. Indeed, the fact that public debt is so high and that public pensions are unfunded is testimony to the fact that the political process is very much tempted by the availability of short-run gains and discounts the subsequent long-run losses.

The results in the literature suggest that the magnitude of the long-run

gains could be immense, much greater than the gains usually attributable to the elimination of conventional capital market distortions. However, at this point in time the results can be regarded only as suggestive, not as definitive. Nonetheless, they do indicate the importance of taking into account the long-run implications of policies which affect the capital stock by altering the net liability position of the government.

## Notes

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1. A summary of Feldstein's work in this area may be found in Feldstein (1983).
2. This was his upper-bound estimate. His conservative estimate was 11 percent.
3. In this case, GNP would be 18 percent higher in the long run. This was a "best-guess" estimate.
4. See the recent survey by Shoven and Whalley (1984).
5. Ibid., recent work by Cox and Harris (1985) finds much larger welfare losses for Canada from the tariff. Specifically, they find that the gains from free trade with the United States could be significant owing to the presence of scale economies and asymmetries in the size of firms.
6. There is a literature on the endogeneity of the nature and amount of technological progress. See, for example, Arrow (1962), Kaldor and Mirrlees (1962), and Kennedy (1962). In each of these cases, technological progress is increased by the amount of investment or capital stock. This growth would serve to magnify the effects discussed in this paper.
7. See the survey by Hahn and Matthews (1964).
8. See, for example, Boadway (1979) and Auerbach, Kotlikoff, and Skinner (1983).
9. For a discussion of these exemptions, see Boadway and Bruce (1985).
10. This relationship is discussed in Boadway and Bruce (1984), as is the more general issue of the social discount rate.
11. See, for example, Samuelson (1958) for an early analysis of the Golden Rule in an overlapping-generations economy.
12. A. Asimakopulos has suggested that this result of everyone's being better off depends on an acceptance of the scheme's going on indefinitely (i.e., to infinity). If this notion seems inconceivable, as it does to him, then we must acknowledge that eventually the scheme must be terminated. When that occurs, the generation about to retire is made worse off, so the scheme cannot be welfare-improving. The economy is not therefore dynamically inefficient. Nonetheless, it is true that if  $n > r$ , per capita utility can be increased for as long as the scheme is in effect.
13. We neglect money supply increases as a source of government revenues and the inflation tax they impose.
14. The exact form of the long-run government budget constraint is developed in Kotlikoff (1984).
15. This is the term used by Summers (1981).
16. They show that the capital-labour ratio varies inversely with the debt per capita ratio,  $b$ , if one considers only stable steady states. There will also be unstable steady states whose capital-labour ratio rises with  $b$ . Transitions in response to increases in debt per capita will tend toward the stable steady states and we consider only those states.
17. This equivalence is developed in Atkinson and Stiglitz (1980).
18. It would be exactly one for one if  $r = n$ , but greater than one for one if  $r > n$  because

- steady-state per capita interest payments would exceed the rate of growth of debt per capita. See Phelps and Shell (1969).
19. Feldstein (1974b) recognized this ambiguity in the analytical underpinnings to his empirical work.
  20. As an alternative measure of social security wealth he used a net concept which deducted the present value of future payroll tax payments. It made no qualitative difference to the results.
  21. See the recent survey by Shoven and Whalley (1984).
  22. See Feldstein (1974a), Grieson (1975), Boadway (1979), Ballentine (1978), and Fullerton et al., (1981). See also Atkinson (1971), who looks at the personal incidence effects of tax changes in the long run.

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# Keynesian Theories of Accumulation and Their Policy Implications

## *A Critical Review*

A. ASIMAKOPULOS

### Introduction

John Maynard Keynes' book *The General Theory of Employment, Interest and Money*<sup>1</sup> was written in an attempt to provide a theoretical explanation for a continuing state of unemployment, unemployment that exceeds the "frictional" unemployment that arises as individuals move between jobs in response to changes in the economy. For Keynes, the writing of his book was "a long struggle of escape . . . a struggle of escape from habitual modes of thought and expression" (Keynes, 1936, p. viii), since it led him to challenge the standard view of economic theorists (which he labelled "classical theory") that the equilibrium level of employment in the economy — the one to which economic forces led — was one of full employment. This view recognized the possible presence of disturbances that resulted in cyclical fluctuations, and considerable attention had been devoted to trying to analyze the monetary and other factors that might be responsible for initiating these fluctuations, or for making them more severe, but the "normal" level of employment — abstracting from cyclical variations — was assumed to be one of full employment.

Money also had an important role to play in Keynes' analysis, a role that was not restricted to a study of cyclical movements. His theory, which was developed for a monetary production economy, integrated real and monetary factors; it did not abstract from the problems introduced by the existence of money in order to deal with "real" features, such as the level of employment. He argued that a "monetary economy . . . is essentially one in which changing views about the future are capable of influencing the quantity of employment and not merely its

direction” (ibid., p. vii). Keynes considered that his theory deserved the adjective “general,” as compared to the “classical theory [which is] applicable to a special case only and not to the general case, the situation which it assumes being a limiting point of the possible positions of equilibrium” (ibid., p. 3).

Keynes’ theory had a tremendous influence on the economics profession, but even for those who accepted the “revolutionary” aspects of his theory, there was an obvious need to extend it to the long period where investment activity changed productive capacity. His theory assumed given productive capacity and was thus restricted to a Marshallian short period. This was a period of time that Marshall saw as falling in the range roughly of “a few months to a year” (Marshall, 1920, p. 379). The subject of the present study is a critical examination of the attempts to extend Keynes’ theory in this way, by R.F. Harrod and Joan Robinson. A useful preliminary to this examination of their writings on growth will be a statement of Keynes’ theory, since it is the starting point for their analyses. In this study, Keynes’ claim for the “general” nature of his analysis is accepted. It should be noted, however, that this claim did not go unchallenged in the economics literature. Some aspects of Keynes’ theory were incorporated in a revised “classical” theory by, for example, J.R. Hicks (1937), and F. Modigliani (1944); they argued that Keynes’ result of involuntary unemployment in equilibrium was due to special features in his theory, such as the assumption of a liquidity trap that sets a floor to the rate of interest, or of rigid money-wage rates. A very large literature on Keynes’ writings and those of his interpreters has been produced — a literature in which the label “Keynesian” often has very different meanings — that falls outside the scope of this study. The adjective “Keynesian” will be used here in a very restricted sense to cover only the writings of Keynes, and their interpretation and extension by Harrod, Robinson, and R.F. Kahn. These three read and made extensive comments on drafts of *The General Theory*, and Keynes read and generally approved of their early writings that dealt with various aspects of his theory.

Keynes’ theory recognized some of the limitations imposed on the operations of actual economies by institutional factors, in particular, the setting of wage contracts in terms of money, and the absence of futures markets for many of the commodities produced. The former meant that the real-wage rate and the level of employment were not determined in the labour market, but had to be explained by conditions in the commodity markets. The overall level of employment could be lower than the amount of labour workers would want to supply at the corresponding real-wage rates, with the difference between labour supply and labour demand representing involuntary unemployment. In Keynes’ model, changes set in motion in the labour markets by this imbalance would

affect money-wage rates, and not necessarily the level of employment and real-wage rates. The absence of futures markets for many goods meant that effective demand might be insufficient to result in full employment, because investment expenditures could be adversely affected by uncertainty over future conditions, uncertainty that cannot be eliminated by current transactions in futures markets. Entrepreneurs could suffer losses if projected demand did not materialize sufficiently, and fear of such future losses could produce a current slowdown.

Keynes' analysis did not proceed in historical time, as we shall see below, but it is set in a period of historical time and builds on the consequences of the distinction between past, present and future in historical time. In Joan Robinson's words: "Keynes was looking at the actual situation and trying to understand how an actual economy operates; he brought the argument down from timeless stationary states into the present, here and now, when the past cannot be known" (Robinson, 1971, p. ix). As a result of this uncertainty over future conditions, the economy could get mired in situations where labour and productive capacity were underutilized, and governmental intervention — for example, an increase in government expenditures — could result in increased economic activity.

## **The General Theory**

### ***The Historical Setting***

The setting for Keynes' General Theory is a particular point in historical time in a capitalist economy that has the general features of, say, the British or American economies in the 1930s. An important part of total production is organized by firms controlled by entrepreneurs, who own or rent capital equipment, hire workers, and purchase the raw materials and intermediate goods required to produce output for sale. The analysis concentrates on the actions of these firms, and abstracts from, among other things, governmental economic activity. The contracts these firms enter into, for example, their wage bargains, are expressed in money terms. Their aim in undertaking these contracts and engaging in production is eventually to end up with more money than they started with.<sup>2</sup> Keynes' point in time has all the characteristics of Marshall's short period, since productive capacity is assumed to be given, even though investment is taking place in this period, investment that will change productive capacity over time. His theory is thus based in a period of time sufficiently short (for example, a quarter of a year, or even a year) that the change in productive capacity which takes place within that period of time can be ignored without distorting too much the reality the theory is supposed to reflect. Similarly, the quantity and quality of the

labour force is assumed to be given, even though it is recognized that these features will change over time. Keynes put this point in the following way:

We take as given the existing skill and quantity of available labour, the existing quality and quantity of available equipment, the existing technique, the degree of competition, the tastes and habits of the consumer, the disutility of different intensities of labour and of the activities of supervision and organization, as well as the social structure including the forces, other than our variables below, which determine the distribution of the national income. This does not mean that we assume these factors to be constant; but merely that, in this place and context, we are not considering or taking into account the effects and consequences of changes in them. (Keynes, 1936, p. 245)

Although Keynes' analysis is set in a particular period in historical time, and observes some of the restraints of that setting, it abstracts from many changes that would be occurring through time and generally concentrates on positions of short-period equilibrium. There is no investigation of the time it would take to reach a new position of equilibrium if there is some change, or whether the experience of being out of equilibrium would affect the final equilibrium position. The normal multiplier effects of an increase in investment are deduced by comparing short-period equilibrium positions in which productive capacity can be taken to be approximately the same.<sup>3</sup>

### *The Labour Market and Effective Demand*

Keynes prepares for the development of his theory of effective demand by emphasizing that the wage bargains between entrepreneurs and workers determine money-wage rates, and not real-wage rates. He denies what he presumes "classical theory" to assume: that labour is in a position to decide the real wage for which it works. Real-wage rates depend on the prices for wage goods as well as on the money-wage rates that are set in labour markets. These prices reflect, given money-wage rates and the other factors affecting the costs of production, demand conditions in product markets. Keynes builds into his theory the recognition of the lapse of time between decisions to produce by utilizing existing equipment (that is, decisions to offer employment) and the sale of the resulting output. These decisions must thus be based on "short-term expectations," which are "concerned with the price which a manufacturer can expect to get for his 'finished' output at the time when he commits himself to starting the process which will produce it" (Keynes, 1936, p. 46). The level of employment offered at a particular point in time thus depends on the short-term expectations of entrepreneurs and the cost conditions they face. For individual firms, or for individual industries, these cost conditions are reflected in short-period supply curves,

with actual output (and the corresponding employment) being determined by the prices that entrepreneurs expect to be able to obtain in competitive markets for their outputs in the particular short period. On the basis of these industry short-period supply curves, Keynes erects a comparable theoretical construct for the economy as a whole: the aggregate supply function.<sup>4</sup>

The aggregate supply function shows the relationship between the entrepreneurs' expectations of proceeds and the level of employment they will give on the basis of these expectations. In this function, the expectation of proceeds is the independent variable and the level of employment is the dependent variable. Proceeds are a money flow (for example, dollars per week on average over the short period) obtained by multiplying for each industry, expected price and the profit-maximizing output for that price, and then subtracting user costs to eliminate inter-firm purchases in order to avoid double counting. These proceeds will thus add up to totals reflecting gross national product. It is important to realize that the aggregate supply function is not a decision function, there is no entity making decisions on the basis of such a function; it is a summary function constructed to indicate how employment in the economy is determined. The decision functions, as far as output and employment are concerned, are the short-period supply curves of the competitive firms, and their independent variables are the firms' expected prices for their outputs. It is at this level that employment decisions are made.

Given the aggregate supply function (and keeping its nature and construction in mind), we can deduce that the volume of employment will be given by the point on the aggregate supply function corresponding to the entrepreneurs' short-term expectations. It is at this point, in Keynes' words, "that the entrepreneurs' expectation of profits will be maximized" (*ibid.*, p. 25). Keynes needed to go beyond this determination of the level of employment in order to meet the "classical theory" on its own ground; he had to examine the "equilibrium" (or "short-period equilibrium") level of employment. This is the level of employment that corresponds to a position of rest, given the values of the parameters in the particular short period. These parameters are the firms' short-period supply curves, planned investment of the period, and the economy's propensity to consume. At the equilibrium level of employment the actual proceeds resulting from that level of employment (when realized investment is equal to planned investment, and consumption is in the desired relation to income) are equal to the expected proceeds, which lead to the offer of this volume of employment. It is in this connection that the aggregate demand function has an important role to play in the analysis. Unfortunately, the first definition Keynes gives of this function is inconsistent with the microfoundations of his theory, and the nature of this function must be inferred from these microfoundations and the way he uses it.<sup>5</sup> This function shows the proceeds (with user costs again

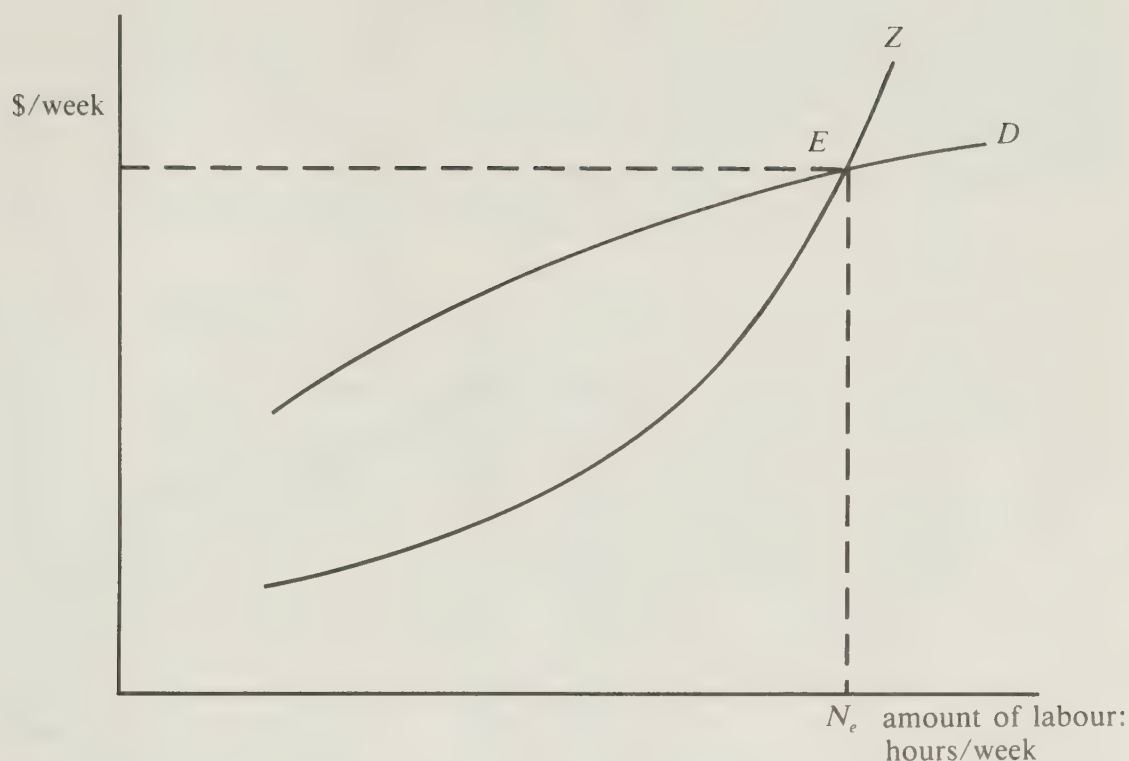
being deducted) that entrepreneurs will receive as a function of the level of employment they give, if actual investment is equal to planned investment, and consumption is in the desired relation to income. Here employment is taken to be the independent variable, and proceeds the dependent variable.

If the aggregate supply and aggregate demand functions as defined above are represented in a diagram, then their point of intersection would show the volume of employment where short-term expectations of proceeds are equal to the proceeds that would be received from that employment under the special conditions of short-period equilibrium. The value for the proceeds at this point of intersection is called by Keynes the effective demand.<sup>6</sup>

A comparable pair of aggregate demand and supply functions are represented in Figure 7-1 by the  $D$  and  $Z$  curves, respectively. They are each drawn up on the basis of the same money-wage rates — money-wage rates that are assumed to be unaffected by the different levels of employment over which these curves are drawn.<sup>7</sup> The shapes of the curves reflect the assumptions made about their determinants. The  $Z$ -curve, beginning with points closer to the ordinate and then moving to the right, becomes convex to the horizontal axis, because higher levels of employment will be offered — given the positively-sloped industry short-period supply curves — only if the prices expected are higher relative to money-wage rates. The wage share in total output is lower at higher levels of employment, and the value for the elasticity of the aggregate supply curve becomes smaller.<sup>8</sup> The real-wage rate corresponding to any point on the aggregate supply curve is thus lower than the real-wage rate for a point to its left. This relation is due to Keynes' assumption of competitive industries and of diminishing returns to the increased employment of labour in the short period with its given productive capacity. The  $D$ -curve, which reflects the values of a given volume of planned (and actual) investment and consumption expenditures that are in the desired relation to income, cuts the  $Z$ -curve from above. It lies below the  $Z$ -curve to the right of their point of intersection, because it is drawn up on the assumption that the economy's marginal propensity to consume has a value smaller than one. Point  $E$  represents a position of short-period equilibrium, with  $N_e$  being "the volume of employment in equilibrium [that] depends on (i) the aggregate supply function . . . (ii) the propensity to consume . . . and (iii) the volume of investment. . . . This is the essence of The General Theory of Employment" (Keynes, 1936, p. 29).

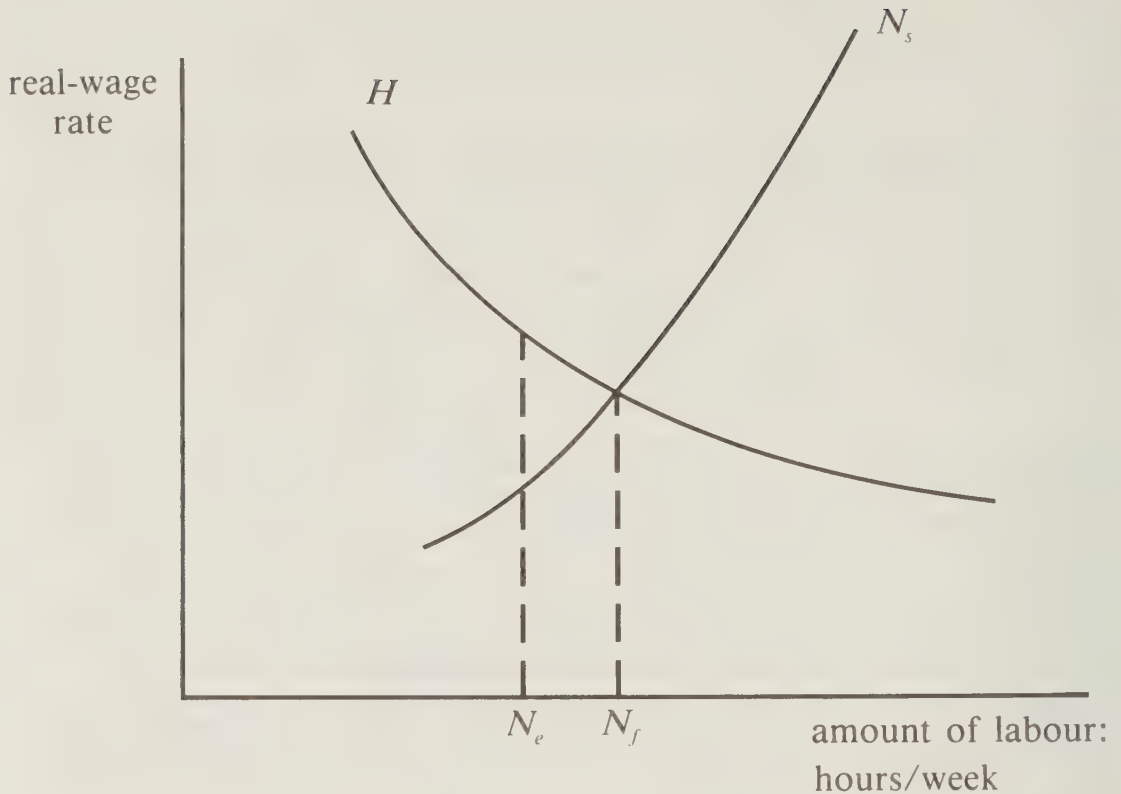
Keynes argued that the equilibrium represented by point  $E$  in Figure 7-1 is stable. If, under the conditions reflected in these curves, entrepreneurs should mistakenly give employment greater than  $N_e$ , the proceeds they will obtain (as shown by the  $D$ -curve) will be smaller than those required (as shown by the  $Z$ -curve) to justify this offer. They will

FIGURE 7-1



thus reduce employment toward the equilibrium level  $N_e$ . Conversely, if the initial level of employment given is less than  $N_e$ , the receipt of proceeds greater than that required will induce entrepreneurs to increase employment and thus to move toward the equilibrium level. Keynes contrasts his approach with that of “classical” theory by stating that for the latter, the aggregate demand and supply functions coincide, and thus “the volume of employment is in neutral equilibrium for all values of  $N$  less than its maximum value; so that the forces of competition between entrepreneurs may be expected to push it to this maximum value” (ibid.). According to this interpretation, an increase in the level of employment will result in the higher proceeds required to justify this increase. This accommodation of the aggregate demand function to the aggregate supply function could be due, for example, to a marginal propensity to spend out of wages and other factor incomes equal to unity, with entrepreneurs as a group increasing their expenditures on consumption and investment to match the anticipated increase in their gross profits from higher expected prices. A possible justification for the “classical” theory along this line was offered by Robertson in his review of *The General Theory*, a justification that drew heavily on the possibility of sufficient induced investment if a higher level of employment was offered, an offer which would be a mistake according to Keynes’ theory. “But perhaps, as output grows . . . consumption breeds investment, as well as investment consumption. The mistake will turn out not to have

FIGURE 7-2



been a mistake after all” (Robertson, 1936, p. 169). In Keynes’ vision of capitalist economies, investment does not so readily adapt itself to the values required to produce full employment.

The only general constraint that Keynes recognizes on the value for equilibrium employment  $N_e$  is that it cannot exceed the full employment level. In Keynes’ model, as we have seen, the level of employment and the real-wage rate are inversely related, and thus a point could be reached where a further increase in effective demand would not increase employment, as the labour force refuses to provide the increased person-hours demanded at the terms offered. The level of employment at this point is called full employment, since “aggregate employment is inelastic in response to an increase in the effective demand for its output” (Keynes, 1936, p. 26). Its determination can be illustrated by Figure 7-2.

The curve labelled  $H$  in Figure 7-2 represents the inverse relation between the real-wage rate and the level of employment, which Keynes’ theory shares with “classical” theory. The difference is that for Keynes, as we have seen, the real-wage rate and the level of employment are not determined in the labour market. The curve  $N_s$  is the supply curve of labour: it shows the real wage required to elicit any specified supply of hours of labour per week. It is drawn with a positive slope in order to reflect Keynes’ assumption that increased marginal disutility is attached to more hours of employment. The point of intersection of  $H$  and  $N_s$

illustrates the full employment level of employment,  $N_f$ . The equilibrium level,  $N_e$ , can lie to the left of  $N_f$ , but not to the right. Keynes explained this asymmetry as being “merely a reflection of the fact that whilst labour is always in a position to refuse to work on a scale involving a real wage which is less than the marginal disutility of that amount of employment, it is not in a position to insist on being offered work on a scale involving a real wage which is not greater than the marginal disutility of that amount of employment” (Keynes, 1936, p. 191).

### *Investment and the Multiplier*

Keynes concentrated in *The General Theory* on studying the properties of the short-period equilibrium position, such as the one at point *E* in Figure 7-1 and in comparing different equilibrium positions. For example, if the *D*-curve in Figure 7-1 were higher, due to a higher volume of investment, then the equilibrium level of employment would also be higher. The employment multiplier is the ratio of the difference in equilibrium employment to the difference in investment, the values for all the other parameters being given, and it can be used to calculate the changes in the equilibrium level of employment corresponding to a change in investment. The value for the multiplier depends, given the shape of the aggregate supply curve, on the slope of the aggregate demand curve, that is, on the economy's marginal propensity to consume. The steeper the *D*-curve, the greater the value for the marginal propensity to consume, and the greater the value for the multiplier. In an equilibrium position not only is saving equal to investment, as it must be due to the definitions of these terms, but the saving taking place is in the desired relation to income, since the *D*-curve incorporates the consumption function for the economy. This desired saving is brought to equality with investment in Keynes' model through changes in the level of employment (and income). Keynes, by dealing only with equilibrium positions, abstracted from questions having to do with adjustments to changes in investment, such as the time required for these adjustments to be made, and whether the path taken would affect the final destination. He stated, without supporting argument, that “there is no reason to suppose that more than a brief interval of time need elapse before employment in the consumption industries is advancing *para passu* with employment in the capital-goods industries with the multiplier operating near its normal figure” (Keynes, 1936, pp. 124 – 25). This neglect of the time required for the adjustment process set in motion by an increase in investment affected — among other things — his statements about the “revolving fund” nature of the finance used for increases in investment, as we shall see below.

Keynes' model explicitly recognizes some of the limits placed on it by its setting at a point in historical time — for example, the fixed and

specific nature of the productive capacity available, and the uncertain knowledge of future conditions — but its neglect of questions dealing with adjustments to changes took Keynes' analysis "out of time." There is also a blurring of the distinction between realized and expected proceeds in order to concentrate on equilibrium positions. There was, as noted above, the recognition of the role of short-term expectations in determining output (and employment) decisions because of the passage of time between the decision to produce and the time output was ready for sale: "The *actually realized* results of the production and sale of output will only be relevant to employment in so far as they cause a modification of subsequent expectations" (ibid., 47, emphasis in original). How entrepreneurs adapt to the disappointment of short-term expectations is part of the story for an analysis set in historical time, even if it is restricted to the short period. (Explicit recognition of long-term expectations on which investment decisions are based, and adjustments to differences between realized results and these expectations should be part of the story of long-period analysis, as we shall see in the presentation of the theories of Harrod and Robinson below.) This aspect is not dealt with in Keynes' analysis, as he assumed that short-term expectations are generally based "on the assumption that the most recently realized results will continue . . ." (ibid., p. 51). These realized results were assumed to come from the point of intersection of the aggregate demand and supply curves, and thus to reflect equilibrium conditions. In the surviving notes for his 1937 lectures, Keynes recognized that the absence of a discussion of the effects of disappointed short-term expectations should be rectified. "I now feel that if I were writing the book again I should begin by setting forth my theory on the assumption that short-period expectations were always fulfilled; and then have a subsequent chapter showing what difference it makes when short-period expectations are disappointed" (Keynes, 1973, p. 181). The concentration on equilibrium conditions, of course, allowed him to present a challenge to "classical theory" on its own grounds, without providing a justification for questions being raised about his finding of the existence of involuntary unemployment being due to mistaken expectations.

### *The "Central Message"*

Keynes' "central message" in his *General Theory* is twofold.<sup>9</sup> First, the economy can be in equilibrium at a situation of less than full employment, an equilibrium that is stable because the economy's marginal propensity to spend is less than one. Second, the primary role in determining this equilibrium level of employment, and variations in it, is given to the volume of investment. That these two items comprise his "central message" can be deduced, not only from *The General Theory*, but also

from his reflections on his theory. He writes, in a letter of appreciation to A.P. Lerner for the latter's 1936 review of *The General Theory*, the "point which was important to my own thought was the discovery that, as income increases, the gap between income and consumption can be expected to widen. . . . A higher level of income will only be possible without loss to the entrepreneur, if the widening gap between income and consumption can be filled. This can only be filled by investment. Yet it is evident that the requisite volume of investment is not necessarily there" (Keynes, 1979, p. 215). The importance of investment in his theory was given strong emphasis in his 1937 *Quarterly Journal of Economics* article, which was written in response to a series of four articles on *The General Theory* that had appeared in an earlier issue of that journal.

- The theory can be summed up by saying that, given the psychology of the public, the level of output and employment as a whole depends on the amount of investment. I put it in this way, not because this is the only factor on which aggregate output depends, but because it is usual in a complex system to regard as the *causa causans* that factor which is most prone to sudden and wide fluctuation. More comprehensively, aggregate output depends on the propensity to hoard, on the policy of the monetary authority as it affects the quantity of money, on the state of confidence concerning the prospective yield of capital assets, on the propensity to spend and on the social factors which influence the level of the money wage. But of these several factors it is those which determine the rate of investment which are most unreliable, since it is they which are influenced by our views of the future about which we know so little. (Keynes, 1973, p. 121)

The "level of output and employment" referred to in the above quotation is the short-period equilibrium level. The term "equilibrium" is used by Keynes to refer to a position of rest only with respect to the variable of interest, which is in this case employment (Asimakopulos, 1973). There could be changes in other variables in the model, but as long as their net effects on the volume of employment tend to be negligible, it is not inconsistent to consider the model to be in equilibrium even though these changes are occurring. For example, there could be increasing money-wage rates if the level tends toward full employment, or falling money-wage rates when employment is much below full employment. Such changes in money-wage rates would lead to shifts in the aggregate demand and supply curves of Figure 7-1, since they are drawn up on the basis of the same money-wage rates at all levels of employment. The shifts in these curves, due to the change in money-wage rates, are in the same direction, and thus the volumes of employment corresponding to their points of intersection might be roughly unchanged. An appreciable difference in the equilibrium employment would require the changes in money-wage rates to result in a change in investment or in the propensity to consume.

Keynes did not believe that decreases in money-wage rates would provide a sufficient impetus to investment, through their tendency to decrease the rate of interest as a result of the lower demand for money that follows lower money wages and prices, in order to be a useful remedy for involuntary unemployment, and he thought they would probably have adverse effects on the propensity to consume. He had similar doubts about the efficacy of monetary policy designed to reduce the rate of interest. “Just as a moderate increase in the quantity of money may exert an inadequate influence over the long-term rate of interest, whilst an immoderate increase may offset its other advantages by its disturbing effect on confidence; so a moderate reduction in money-wages may prove inadequate, whilst an immoderate reduction might shatter confidence even if it were practicable” (Keynes, 1936, pp. 266–67). Keynes’ recognition of the consequences for investment decisions of an uncertain future, where “an exact calculation of benefits to come” (ibid., p. 162) cannot be taken seriously, meant that he did not believe investment could be “fine tuned” by changes in interest rates in order to achieve the value required for full employment. Substantial increases in the rate of interest, and credit restrictions that kept funds out of the hands of potential investors, could decrease investment if its level were considered to be excessive, but its decline might then become precipitous as lower investment leads to lower profits, with possible adverse effects on long-term expectations. In periods of depression, the uncertainty over the outcome of investment at a time of general pessimism could make the benefits of the lower costs of borrowing money appear to be insignificant in many areas.

### ***Finance and Investment***

Keynes published two articles in the *Economic Journal* in 1937,<sup>10</sup> prompted in large part by Ohlin’s (1937) articles on the “Stockholm” theory. He wrote of Ohlin: “He has compelled me to attend to an important link in the causal chain which I had previously overlooked, and has enabled me to make an important improvement in my analysis” (Keynes, 1973, pp. 215–16). Investment was the key independent variable in Keynes’ short-period analysis, and variations in its value result in variations in the equilibrium level of output, with desired saving brought into equality with investment through these variations in output. For firms to be able to invest as they please, they must be able to obtain the funds required to carry out their investment decisions. Keynes used “the term ‘finance’ to mean the credit required in the interval between planning and execution” (ibid., p. 216n) of investment. The banking system has an important role to play here since an increase in investment would be possible only if it provides firms with the finance to implement their investment decisions. Keynes put this vividly: “in general, the banks

hold the key position in the transition from a lower to a higher scale of activity” (ibid., p. 222). (More bank credit is also necessary in order to satisfy the transactions motive when the level of economic activity is higher following increased investment. This increase in transactions demand is ignored in the following.)

There was also passing recognition of the importance of the availability of long-term finance if firms are to increase investment in fixed capital. “The entrepreneur when he decides to invest has to be satisfied on two points: firstly, that he can obtain sufficient short-term finance during the period of producing the investment; and secondly, that he can eventually fund his short-term obligations by a long-term issue on satisfactory conditions” (ibid., p. 217). The subsequent analysis, however, ignored the second point, with reference being made only to the short-term rate of interest under the implicit assumption of an unchanged term structure. Keynes was very anxious to maintain his liquidity preference explanation of the determination of the rate of interest, with saving having no role to play in this, or in facilitating investment. “. . . there will always be *exactly* enough *ex post* saving to take up the *ex post* investment and so release the finance which the latter has been previously employing. The investment market can become congested through shortage of cash. It can never become congested through shortage of saving. This is the most fundamental of my conclusions within this field” (ibid., p. 222, emphasis in the original). Keynes ignored the time required for the full multiplier effects to occur, since the *ex post* equality between saving and investment is not sufficient for the liquidity position of the banking system to be restored to its initial state before the funds were advanced to increase investment, for finance to be, in Keynes’ expression “a revolving fund.” This restoration requires that bank loans, equal in amount to those advanced to investing firms, be repaid, and only the increase in saving that is in the desired relation to income is potentially available to retire bank debt.

Kaldor, in his important 1939 paper on “Speculation and Economic Stability” (reprinted in Kaldor, 1960), extended Keynes’ analysis by recognizing the time required for the full multiplier to operate and the importance of the term structure of interest rates. Speculators were introduced into Keynes’ model, who would be prepared to take uncovered positions, borrowing short from the banks and lending long to firms, at a roughly unchanged term structure of interest rates. An increase in bank finance could thus be translated into the long-term funds firms prefer for fixed investment, even before the operation of the multiplier brought desired saving into equality with the increased investments. It was assumed that the resulting increase in desired saving would be used, directly or indirectly, to purchase the bonds of the investing firms. Kaldor showed that the size of the speculative commitment required to provide long-term funds for a sustained increase in the

level of investment depends on the size of the investment and the propensity to save.<sup>11</sup> Kaldor concluded that although Keynesian theory is a “special case,” since it depends on the price stabilizing influence (that is, maintenance of an unchanged term structure of interest rates) of speculators, it “gives, nevertheless, a fair approximation to reality” (Kaldor, 1960, p. 52).

Kaldor’s judgment reflects economic conditions (“reality”) at the time at which his article was written: unemployment, idle productive capacity, ample stocks of raw materials, relatively stable prices and money-wage rates. In other circumstances there may be downward pressures on the prices of long-term securities, even if the banks are prepared to increase their short-term loans at an unchanged rate of interest, because savers find other assets more attractive to hold. In such cases a higher propensity to save — because it reduces the required speculative commitment — would facilitate the increase in investment, contrary to Keynes’ statements.

Kaldor noted the limitations of Keynes’ analysis — even under the conditions of the 1930s — for an open economy, since the increase in desired domestic saving will be less than the increase in domestic investment. The difference between the two is equal to the increase in the deficit in the trade balance. Only if this increase in the deficit is financed by the inflow of foreign funds directed to the purchase of long-term domestic securities at an unchanged term structure, would the situation be similar to that of a closed economy. In other cases the term structure would have to change to allow the increase in long-term debt to be absorbed by speculators. “The long-term rate rises *relatively* to the short-term rate simply because, owing to a shortage of savings, speculators are required to expand continuously the size of their commitments; and there are limits to the extent to which this is possible” (ibid., p. 51, emphasis in the original).

The introduction of government expenditure and taxation into Keynes’ model, with the possibility of large government deficits, also serves to make his views on finance, investment and saving a “special case.” These deficits raise fears about future interest rates, and even an increase in potential availability of bank finance may not permit an increase in investment. A higher propensity to save, given the expected government deficits, may ease fears about future long-term interest rates, and thus facilitate the provision of long-term finance for investment in the present (Asimakopulos, 1983b). The possible relations between investment and saving in a Keynes-type model are thus complex, and no statement about a unidirectional relation between them is generally valid. In some circumstances, where the “animal spirits” of entrepreneurs that drive investment (Keynes, 1936, p. 161) are low, and there is excess productive capacity and substantial unemployment, an increase in the propensity to consume (a lower propensity to save) could increase effective demand and act as a spur to higher investment. In

other circumstances, where the urge to accumulate is strong and the resources of the economy are being strained, a higher propensity to save might help make it possible to increase investment, by helping to ensure the availability of long-term finance at an unchanged term structure. There is a similar complex relationship between the thriftiness conditions and the rate of accumulation in Joan Robinson's model of growth, as we shall see below.

### ***Policy Implications***

In cases where the equilibrium level of employment is smaller than the full employment level, anything that increases the economy's propensity to consume or its volume of investment, would increase employment. Keynes' theory thus led him to look favourably on government deficits, whether incurred as a result of increased expenditures on current account (which he saw as an increase in the propensity to consume), or on capital account (which increases investment). He argued that the community could be enriched, when involuntary unemployment exists, by loan expenditures even if they were "wasteful" (Keynes, 1936, pp. 128–31).

There is in Keynes' model an inflation potential in policies that result in increased employment, since he recognized that money-wage rates "will tend to rise as employment improves" (ibid., p. 249). Money-wage rates are assumed to be given for the curves drawn in Figure 7-1, but policies that increase consumption and/or investment (and thus employment) also tend to increase money-wage rates, and lead to further upward shifts in the aggregate supply and demand curves, which could become cumulative. Keynes recognized the inflationary potential of a full employment policy, but he implicitly assumed in *The General Theory* that there was scope for substantial increases in the level of employment before rising prices became a problem. That the inflationary implications of a full employment policy were embedded in Keynes' General Theory can be seen in Joan Robinson's paper entitled "Full Employment," which appeared in her 1937 *Essays in the Theory of Employment*. Keynes had read this paper in draft, as noted by Kahn (1974, p. 29), and approved its final form. She had written: "The demand for higher money wages is made with growing success as employment increases and when full employment is reached it becomes overwhelmingly strong" and "the point of full employment, so far from being an equilibrium resting place, appears to be a precipice over which, once it has reached the edge, the value of money must plunge into a bottomless abyss" (Robinson, 1937, pp. 9 and 17). Robinson argued that this consequence of full employment would prevent the achievement of such a state, as the monetary authorities take action to prevent the fall in the value of money by trying to restrict its supply and raising the rate of interest. The latter restrains

investment and thus has adverse effects on employment. It was recognized by Keynes and his close followers that the problem of keeping the rise in money wages within modest limits as full employment is approached was a political problem.<sup>12</sup> This problem is made particularly difficult by the fact that any incomes policy must be concerned not only with the broad distribution of income between wages and profits, but must also deal with the conflicting interests of different groups of workers. In *The General Theory* use is made of a single money-wage rate, even though it is recognized that there are many labour skills, with different wage rates. It is assumed that the relative wage rates of different types of labour are given, and they are proportional to efficiency (Keynes, 1936, pp. 41–42). When the feasibility of an incomes policy is considered, the serious problems involved in deciding on, and enforcing, appropriate relative wage rates should not be ignored. The pervasiveness of this problem was recognized implicitly in Keynes' discussion of the labour market, where he explained workers' resistance to cuts in money-wage rates — a resistance much stronger than that which would result from an equivalent cut in real-wage rates due to an increase in the price of wage goods — because of the fear of “a *relative* reduction in real wages” (Keynes, 1936, p. 14, emphasis in original).<sup>13</sup>

In Keynes' *General Theory*, a capitalist economy may experience lengthy periods of time with less than full employment because the investment planned, taken in conjunction with the economy's propensity to consume, is insufficient to achieve full employment. An increase in government expenditures, on both current and capital account, financed by borrowing would increase employment, but such a policy might be accompanied by inflationary pressures.

## Harrod's Dynamic Economics

### *Setting and Concepts*

Keynes' *General Theory* was concerned with the factors determining the level of employment in a short-period situation with given productive capacity. The volume of investment in that period is an important determinant of employment because of its demand-creating role, but its other role of creating productive capacity is ignored. With the extension of the time period to include a series of short periods, the effects of investment on productive capacity cannot be ignored without doing violence to the reality the model is supposed to reflect. Such an extension would also necessitate taking into account possible changes in the size and training of the labour force and in technical knowledge. Analyses that take explicit account of these changes can be considered to be dynamic, since they incorporate events that occur over time.

Harrod's distinction between static analysis and dynamic analysis

relates specifically to whether the analysis abstracts from or explicitly allows for continuing changes in what he calls the fundamental conditions, which include productive capacity and the size and ability of the labour force. In fact, the touchstone for him of dynamic analysis is that with the fundamental conditions themselves changing, the unknowns will be rates of change in the values of the variables of interest. This contrasts with his view of static analysis, where the fundamental conditions are taken to be given and known, and the analysis seeks to determine the values of the variables at a point in time. Harrod argued that static analysis — comparative statics — would be sufficient if the concern was simply with the once-over effects of, say, a burst of net investment that leads to higher productive capacity, and then ceases. A comparison of the two equilibrium positions corresponding to the two levels of productive capacity might be sufficient for some purposes in this case, but another method — dynamic analysis — would be required for continuing changes in productive capacity. This view of the domain of dynamic analysis has very much affected the way he set up his own theory of economic dynamics, which was concerned with the factors determining the rate of growth of output at a point in time, rather than with the rate of output at that point in time.

Harrod's dynamic theory received its first full expression in his 1939 *Economic Journal* article, "An Essay in Dynamic Theory." He returned to this topic after the war in a set of lectures "composed during the autumn of 1946 and delivered in the University of London in February 1947" (Harrod, 1948, p. v), which were published in 1948 under the title *Towards a Dynamic Economics*. Harrod's "vision" of the need for dynamic theory to be concerned with rates of increase if it is to be able to deal adequately with, among other things, the trade cycle, goes back to the early 1930s. He noted: "From early days I have held the view that we are not likely to make a correct analysis if we proceed by regarding the phenomena of boom and slump as deviations from a static equilibrium. Instead, I have proposed that they should be regarded as oscillations around a line of steady growth" (Harrod, 1951, p. 251). He also pointed to a 1934 article in which he tried to work out the necessary relations for a regularly advancing society. His 1936 book on *The Trade Cycle* represented a further development of this vision, in which he tried to work out the conditions for a steady advance, but its main focus was on the cyclical movements produced by the interaction of the multiplier and accelerator. His fundamental growth equation that is at the centre of his dynamic analysis was not arrived at until 1938. As Harrod recalled: "In that book [*The Trade Cycle*] there are to be found many of the ideas that have been developed in my subsequent writings on dynamic economies. But I did not, when writing it, have the advantage of having in my mind my fundamental growth equation, which also came to me in a flash on a particular day . . . in July 1938" (Harrod, 1973, p. 41).

Harrod wrote a series of articles in which he commented on some of the interpretations of his theory, and the restatements they contain indicate some movement away from positions he had taken in his 1939 and 1948 writings. His final publication on this topic was his book *Economic Dynamics*, which continued and confirmed this modification of the strong positions taken when his theory was first presented.

This review of Harrod's work on a Keynesian theory of accumulation will examine the former's theory as it was first set out, and then turn to its subsequent modifications, with a view to determining its policy implications. There have been many mistaken interpretations of Harrod's theory in the economics literature — there is even a textbook model labelled “Harrod-Domar” that has very little connection with the former theory — which will largely be ignored in this study. The focus here will be on Harrod's writings, with reference to comments made by others only in so far as they led Harrod to change or clarify his theory.

The relationship between Harrod's dynamic economics and Keynes' theory can be seen when it is realized that Harrod begins where Keynes left off, with the given short-period situation. Harrod accepts the general setting of Keynes' model — a monetary production economy where production and investment depend on the decisions made by entrepreneurs — where knowledge of future conditions is uncertain. Decisions are based on expectations — short-term expectations for production decisions, and long-term expectations for investment decisions — that the participants know may be disappointed by events. Harrod wrote of investment orders: “who places such an order gives a hostage to fortune. . . . Orders are given on the strength (i) of recent experience and (ii) of guess-work with regard to the future” (Harrod, 1936, p. 88). The starting point of the analysis is, as in Keynes, a particular point in historical time — Marshall's short period — and Harrod gives six months as a possible length for this period in his model (*ibid.*, p. 26). The focus of the analysis is, however, in line with Harrod's view of the domain of dynamic analysis, on the rate of change in output at this point in time. Reference is made to three rates of growth of output: the actual or ex post rate of growth ( $G$ ); the entrepreneurial equilibrium or warranted rate of growth ( $G_w$ ); and the full employment or natural rate of growth ( $G_n$ ). The explanation of the trade cycle is based on the instability principle, which draws on comparisons of the values for the actual and warranted rates of growth at a particular point in time.

### *Derivation of the Rates of Growth*

In the particular short period that is the starting point of the analysis, we have the definitional equality between saving ( $S$ ) and investment ( $I$ ). Saving and investment can either be expressed in “gross” terms, with no allowance being made for depreciation during the short period, or in

“net” terms, with an estimate for depreciation having been subtracted from the gross estimate of investment (and saving). The use of gross saving and investment is preferable for a Keynes-type analysis since the short period in which the analysis is based need not, in general, have the long-period equilibrium characteristics that would permit definitive estimates of depreciation. Such estimates depend, in part, on views of future conditions, views that could differ and not bear any close relation to actual conditions in the future except under very special equilibrium circumstances. Harrod, perhaps because of his vision of a moving equilibrium as the centre of his analysis, makes use of net investment and net saving. Equation (1), expresses

$$I = S \tag{1}$$

the definitional equality between these two terms in a particular short period. This short period may be one in which there is short-period equilibrium. As we saw in the discussion of Keynes’ theory, this means that the actual investment is equal to the planned investment, and saving is in the desired relation to income. (One way of indicating the latter condition is to say that actual saving is equal to the economy’s average propensity to save multiplied by the income in that period.) With short-period equilibrium, the full multiplier effects of any change in investment that had occurred would be assumed to have been completed by the end of the short period. Alternatively, there may not be a situation of short-period equilibrium in the particular short period of the analysis, with actual and planned investment differing, and/or saving not in the desired relation to income. Harrod implicitly assumed in his basic 1939 and 1948 works that saving was always in the desired relation to income, but in his 1973 *Economic Dynamics*, he made a distinction between the fraction of income saved ( $s$ ), and the fraction of income that people would want to save ( $s_d$ ).<sup>14</sup>

The critical relation for Harrod in his search for a dynamic equivalent of static equilibrium was that between investment in a period and the change in income over that period. In his concentration on rates of change he did not look at the “static” conditions in the short period. The “static” equation (1) is turned into a “dynamic” equation by multiplying both sides of the equation by different forms of  $1/Y$  (cf. Harrod, 1948, p. 80n). The left-hand side of the equation is multiplied by  $(1/\Delta Y)$  ( $\Delta Y/Y$ ), and the right-hand side by  $(1/Y)$ . The resulting equality can be written as:

$$GC = s \tag{2}$$

$G(=\Delta Y/Y)$  is the rate of growth of income over the period, and  $C(=I/\Delta Y)$ , the “capital coefficient,” is the ratio of investment in the period to the period’s increase in income.<sup>15</sup>

Equation (2) is part of dynamic analysis, according to Harrod’s definition, since it can be rearranged so that its unknown value is a rate of

change. Dividing both sides of the equation by  $C$ , we obtain:

$$G = s/C, \quad (3)$$

which states that the rate of change of output is equal to the ratio of the fraction of income saved to the capital coefficient. This equation is a stepping stone to Harrod's "fundamental equation"; in fact, it becomes the fundamental equation if the actual values for the terms in the equation have equilibrium characteristics. If the fraction of income saved is also equal to the fraction of their income in that period people would want to save, and the investment undertaken in the period turns out to be justified by the increase in output in this period as compared to its value last period, then the rate of growth in output is called the warranted rate of growth. In this equilibrium case, equation (3) can be rewritten as:

$$G_w = s_d/C_r \quad (4)$$

The warranted rate of growth is shown as being equal to the ratio of the desired fraction of income to be saved to the required capital coefficient ( $C_r$ ). The equilibrium represented by equation (4) is an equilibrium for entrepreneurs in their roles as producers and investors. For Harrod, equation (4) "expresses the condition in which producers will be content with what they are doing" (Harrod, 1948, p. 81). Workers may be experiencing involuntary unemployment in this short period, as in Keynes' analysis.

The required capital coefficient that appears in equation (4) is a marginal notion; it is "the requirement for new capital divided by the increment of output to sustain which the new capital is required" (ibid., p. 82). The new capital referred to consists of both working and fixed capital, and if  $C = C_r$ , then the balance between the two categories of capital goods is assumed to be the appropriate one in the circumstances, and the total investment in the period is justified by the increase in output that has occurred. It is important to dwell a little longer on the very special nature of  $C_r$  — even at a cost of some repetition — in order to forestall misinterpretations that have been common in the economics literature. As our development of equation (4) makes clear, this term is not necessarily related to investment *ex ante*, but to a judgment (made by entrepreneurs) that the actual investment in a period is justified in the light of the actual change in output.  $C_r$  is thus not to be used as an acceleration coefficient to determine investment *ex ante*, given the expected increase in output. This interpretation is implicit in the way Harrod manipulates his growth equations, but he made it explicit in a book based on his university lectures, which he published on retirement. "In my growth equations . . .  $C$  refers to the amount of capital actually produced in a given period (divided by the increase of total output) while  $C_r$  refers to the amount of capital that entrepreneurs would like to find

themselves with. . . .  $C_r$  is emphatically not an *ex ante* concept. Entrepreneurs may have planned to have something quite different from what they *now* find it convenient to have, since when they made their plans it could not be foreseen what the demand for their products would be” (Harrod, 1969, p. 165n, emphasis in original). The value for  $C_r$  in any period depends on the state of technology, the rate of interest, and the initial rate of utilization of productive capacity.

Harrod recognizes that some of the investment activity in a period cannot be judged by the increase in output in that period, since it is intended to serve future needs. His adaptation of the growth equations to meet this recognition shows the definitional and *ex post* judgmental nature of his fundamental growth equation. Investment in a period may be divided into two parts, with the first being directly related to the current increase in output, while the second “is not deemed to have any immediate relation to current requirements” (Harrod, 1948, p. 79). If investment of the second kind is denoted by  $K$ , then the first kind is equal to  $I - K$ . The necessary *ex post* equality of  $I$  and  $S$  can be written as  $I - K = S - K$ , and if both sides are multiplied by different forms of  $(1/Y)$ , we obtain:

$$\begin{aligned} (\Delta Y/Y) (I - K)/\Delta Y &= (S - K)/Y, \text{ or} \\ GC &= s - k \end{aligned} \tag{5}$$

where  $k = K/Y$ , and  $C$  is now equal to  $(I - K)/\Delta Y$ . In his 1948 book, the growth equation that recognized the existence of “autonomous” investment was written as above, while in the 1939 essay it was written in equilibrium form (Harrod, 1939, p. 27). Either of these forms can be used, since Harrod’s equilibrium growth equation is based on an *ex post* recognition of certain characteristics of an *ex post* relation.

There is another equilibrium rate of growth in Harrod’s dynamic economics, the natural rate of growth. This would represent an equilibrium for workers as well as for entrepreneurs, since it assumes full employment. The natural rate of growth “is the maximum rate of growth allowed by the increase of population, accumulation of capital, technological improvement and the work/leisure preference schedule, supposing that there is always full employment in some sense” (Harrod, 1939, p. 30). Harrod tended to take the value for this natural rate of growth as being determined independently of current economic activity, by given technical progress and population changes. It was the “optimum” saving ratio ( $s_o$ ) that is treated as the variable whose value is to be determined (Harrod, 1973, p. 28), with the natural rate of growth ( $G_n$ ), and the required capital coefficient being taken as the independent variables, as in equation (6):

$$s_o = G_n \cdot C_r \tag{6}$$

## *The Warranted Rate of Growth — A Closer Look*

The determinants of the value for the warranted rate of growth, the values for the desired saving fraction and the required capital coefficient, reflect behavioural and technological factors as well as the particular circumstances of the point in time being considered. The propensity to save in the economy is affected by the distribution of income between wages and profits, with the proportion of profits saved being assumed to be larger than the proportion of wages saved (see, for example, Harrod, 1936, p. 74). This distribution is affected by the level of economic activity, with a shift to profits occurring in the boom, and a shift away during a slump (*ibid.*). The value for  $s_d$  will thus depend, given other things, on the characteristics of the period being considered. The value for the required capital coefficient depends on the nature of technology and the rate of interest, since they help determine the nature of the plant and equipment introduced to handle an increase in demand, but the particular conditions of the period under study also have a role to play. If the initial level of economic activity is such that plant is being operated at normal productive capacity, then the net investment that would be justified by the increase in output is that which increases productive capacity (along with the requisite working capital) sufficiently to maintain a normal rate of utilization even though output is greater. If initially there is substantial excess productive capacity, then only some investment in working capital would be justified by the increase in output taking place in the period. Given this dependence of the values for the determinants of  $G_w$  on initial conditions, its own possible values also depend on these conditions. Harrod distinguishes between the “normal” warranted rate of growth when normal productive capacity is being utilized, and the “special” warranted growth rates that pertain during booms and slumps (Harrod, 1973, p. 36). It is the former rate that has attracted most attention, and it is this which will be dealt with first, and at greater length.

Harrod states with respect to the “normal” value for  $G_w$  that:

The line of output traced by the warranted rate of growth is a moving equilibrium, in the sense that it represents the one level of output at which producers will feel in the upshot that they have done the right thing, and which will induce them to continue in the same line of advance. Stock in hand and equipment available will be exactly at the level which they would wish to have them. Of course what applies to the system in general may not apply to each individual separately. But if one feels he has over-produced or over-ordered, this will be counter-balanced by an opposite experience of an equal importance in some other part of the field. (Harrod, 1939, p. 22)

He goes on to characterize this equilibrium as being “a unique warranted line of growth . . . determined jointly by the propensity to save and the quantity of capital required by technological and other considerations per unit increment of total output” (*ibid.*, p. 23). In order for the war-

ranted rate of growth to have a unique value, both the desired proportion of income to be saved, and the required capital coefficient must have unique values. Implicit in Harrod's statement is the assumption that there is only one distribution of income between wages and profits (as reflected in a "normal" rate of profit) consistent with his moving equilibrium. Given the distinct propensities to save out of wages and profits, this distribution determines a unique value for the economy's propensity to save. Similarly, given this "normal" rate of profit, and its accompanying rate of interest, technology is assumed to determine a unique value for the required capital coefficient.

A constant value for the "normal" warranted rate of growth is important for Harrod's conception of dynamic equilibrium, since only then will it result in a steady growth path from which cycles can be regarded "as oscillations around a line of steady growth" (Harrod, 1951, p. 261). It is only possible to conceive of producers moving along an equilibrium growth path, in a monetary production economy in which knowledge of future conditions is uncertain, if this path turns out to be one of steady growth. Keynes argued that in such an economy, where for the outcome of many investment decisions "there is no scientific basis on which to form any calculable probability whatever" (Keynes, 1973, p. 114), resort is made to rules of thumb and conventional judgment.

(1) We assume that the present is a much more serviceable guide to the future than a candid examination of past experience would show it to have been hitherto. In other words we largely ignore the prospect of future changes about the actual character of which we know nothing.

(2) We assume that the *existing* state of opinion as expressed in prices and the character of existing output is based on a *correct* summing up of future prospects, so that we can accept it as such unless and until something new and relevant comes into the picture.

(3) Knowing that our own individual judgment is worthless, we endeavour to fall back on the judgment of the rest of the world which is perhaps better informed. That is, we endeavour to conform with the behaviour of the majority or the average. The psychology of a society of individuals each of whom is endeavouring to copy the others leads to what we may strictly term a *conventional* judgment. (ibid., emphasis in original)

Only if the equilibrium path tends to be one exhibiting a steady rate of growth, will it be possible for entrepreneurs, using the above rules, to follow such a path. If the equilibrium path turns out to exhibit changing rates of growth, then it would not be possible for entrepreneurial investment decisions to keep the economy on the path even in the absence of disturbances.

The presence of technical progress adds another potentially disturbing element to a steady growth path. The technical progress that is compatible with Harrod's steady growth path is "neutral" (or "Harrod-neutral") technical progress. It is such that the value of the required capital

coefficient is unchanged at a constant rate of interest. For example, the value of a new plant has increased by the same percentage as the value of its productive capacity, with labour productivity having increased. If, when such technical progress occurs, the real-wage rate increases at the rate at which labour productivity increases, then the rate of profit and the distribution of income between wages and profits would be unaltered. Given the determinants of the warranted rate of growth, we can deduce that in this case its value is also unchanged. In order for entrepreneurs to be able to stay on a warranted growth path when neutral technical progress is occurring — in the absence of perfect foresight — the rate at which this technical progress is occurring must be steady. If this is not the case, then estimates of the rate of obsolescence of plant and equipment would be frequently mistaken, and entrepreneurial investment decisions are unlikely to turn out to be justified by events.

Harrod's position that there is a "unique warranted line of growth" requires that there be a unique value for the distribution of income, and then with the given technology, a unique value for the required capital coefficient. If there could be more than one possible equilibrium distribution of income in the economy, then with different propensities to save out of wages and profits there could be more than one desired saving ratio, and thus more than one value for the warranted rate of growth. This was recognized by Harrod: "if there is more than one possible equilibrium profit share in a dynamic equilibrium, consistent with other dynamic determinants, there must be more than one equilibrium growth rate" (Harrod, 1970, p. 738). The equilibrium distribution of income was not explained by Harrod's model, but his comments on this topic are consistent with a Marshallian theory of distribution based on a long-period equilibrium or normal rate of profit that comprises the rate of interest and gross earnings of management (Marshall, 1920, p. 313). For example, he writes, "firms often have some standard rate of profit which includes interest, that they add to the input costs" (Harrod, 1973, p. 44). Harrod also follows Marshall in viewing interest as "the reward for waiting" (*ibid.*, p. 47), and notes that differences in the rate of interest might lead to different equilibrium rates of profit, and thus to more than one possible value for the warranted growth path. There is thus some movement away from the bold statement of "a unique warranted line of growth" in his 1939 essay, but it is not much. "I would not deny that a multiplicity of equilibrium profit shares and profit rates is a possibility, but it seems to me unlikely" (Harrod, 1970, p. 738).

Along Harrod's warranted growth path producers may be said to be, on balance, in long-period equilibrium, with investment decisions being justified by events and plant being operated at normal productive capacity, with the output sold at "normal" prices. Although he generally inclined toward this interpretation,<sup>16</sup> Harrod was always conscious of the needs of a dynamic equilibrium, with a rate of change entering into

its definition. Not only must the producers be satisfied that they have produced the right amount, with normal productive capacity being utilized, but they must be “in a frame of mind which will cause them to give such orders as will maintain the same rate of growth” (Harrod, 1939, p. 16). The question of what conditions would ensure the latter caused a continuing problem for Harrod, and was never satisfactorily resolved. There was concern that if producers’ capital requirements were met precisely “they might lapse into a stationary condition” and “that perhaps  $C_r$  should be deemed to have a value slightly lower than the required amount of capital, lower, that is, by the amount necessary to keep moving forward on the line of advance” (Harrod, 1948, p. 86). This groping for some rationale for producers to keep moving forward at a steady rate in his Keynes-type world was not successful. When challenged by Alexander (1950), who noted that the continuation of the same rate of growth is no more than an unsupported assertion in his model, Harrod conceded that “my particular definition of a warranted advance depends on an assumption, which is rather special and may be unjustified” (Harrod, 1951, p. 271). Harrod tried to find support for his idea of a warranted growth path in the concept of a “representative entrepreneur” (*ibid.*, pp. 272–73), whose decisions somehow reflect the net results of the decisions of individual entrepreneurs whose experiences and outlooks differ. This entrepreneur is assumed to act so as to maintain the rate of growth that has turned out to be an equilibrium rate. There is, of course, no such entrepreneur, and even if there were, the achievement of equilibrium in one period does not necessarily mean, as Harrod recognized, that the same rate of growth will be continued. “The idea that  $G_w$  is an equilibrium rate of expansion implies a certain behavioural parameter in the representative entrepreneur. Will he, all having turned out well, continue in his previous growth rate? Or will he stay put at the same absolute level of orders?” (Harrod, 1973, p. 19). Harrod leaves these questions unanswered, the only “proposition” on which he stands “firm” is “that the second equation [ $G_w = s_d/C_r$ ] simply gives a definition of what we may call the ‘warranted’ growth rate” (*ibid.*, p. 20). There is nothing to ensure that this rate of growth will be maintained, even in the absence of disturbances. It may be of some interest to examine what the consequences would be if the individual decisions taken by the multitude of entrepreneurs in a monetary production economy just happened (one of a very large number of possible situations) to result in an equilibrium advance. There is, however, no justification for using such a path, as Harrod tried to do, as the centrepiece for the discussion of accumulation and cyclical fluctuations in actual economies.

With the dissolution of Harrod’s early vision of an equilibrium growth path — the “line of steady growth” — into the *ex post* definition of an equilibrium rate of growth at a point in time, a constant value for this

equilibrium is no longer required. A “constant value of  $G_w$  has no more claim to be an equilibrium position in a dynamic system than a growing or declining value of it” (ibid., p. 31). This sequence of non-constant values for  $G_w$  no longer describes a growth path that entrepreneurs in a monetary production economy can be expected to follow under ideal conditions.

The “special” warranted rates of growth in Harrod’s model are defined for situations that cannot be characterized as ones of long-period equilibrium. Their values would generally change in successive periods as the degree of under- or over-utilization of productive capacity, and the distribution of income, change. These rates of growth are used in his discussion of cyclical changes. During recessions the value for  $C_r$  would be lower than its value on the warranted growth path because of excess productive capacity. This would tend to make the value for the “special” warranted rate greater than the “normal” rate, but a possible counteracting effect would come from  $s_d$  whose value also tends to be lower in such a case because of the decline in the profit share.

### *The “Instability Principle”*

Harrod’s initial presentation of his economic dynamics emphasizes the highly unstable nature of his dynamic equilibrium. He argued that if, at a point in time, the actual rate of growth deviates from the warranted rate, then forces will be set in motion to increase this deviation. “Thus in the dynamic field we have a condition opposite to that which holds in the static field. A departure from equilibrium, instead of being self-righting, will be self-aggravating.  $G_w$  represents a moving equilibrium, but a highly unstable one” (Harrod, 1939, p. 22). This same stark vision is to be found in the 1948 book where centrifugal forces are seen to be at work around the line of steady advance. “If the aggregated result of trial and error by numerous producers gives a value for  $G$  which is different from  $G_w$ , there will not be any tendency to adapt production towards  $G_w$ , but, on the contrary, a tendency to adapt production still farther away from it, whether on the higher or lower side” (Harrod, 1948, p. 87). This instability in Harrod’s equilibrium is due to the assumed responses of entrepreneurs to differences between  $G$  and  $G_w$ . If  $G > G_w$ , they increase their orders and give a boost to the rate of growth, while if  $G < G_w$ , the depressing influence of investment that is greater than required by the change in income “will cause a further divergence and a still stronger depressing influence; and so on” (Harrod, 1939, p. 22).

It was these strong statements that led Solow (1956) to coin the term “knife-edge” for the unstable balance of Harrod’s dynamic equilibrium.<sup>17</sup> Harrod responded to criticisms initially by making minor concessions. For example, he recognized, in a move toward Baumol’s (1951) views, that entrepreneurs may not increase their rate of orders

when they experience a shortage of capital, if they consider “the current tempo of advance as abnormal and not capable of being sustained indefinitely” (Harrod, 1959, p. 464). There was no way in which he could evaluate this possibility within the context of his theory of instability because it is expressed solely in terms of rates of growth at a point in time. He did not think that it had a significant impact on the instability principle. “But I suggest that it would be pushing this argument much too far to regard it as obviating the instability principle” (ibid.).

A further lowering in the assumed degree of instability was clearly evident in Harrod’s response to Robinson’s 1970 article “Harrod after Twenty-one Years.” Harrod claimed that the “knife-edge” was an inappropriate term to use in describing the instability of his dynamic equilibrium, and that a “shallow dome” would be a better term. The type of “push” required to get a cumulative movement in the latter case would be larger, and there would be more scope for “friction” to restrain such movement. He concluded that “It needs empirical study, rather than theory, to evaluate the amount of friction” (Harrod, 1970, p. 740).

In *Economic Dynamics*, Harrod’s approach to the instability principle reflects his position in the 1970 paper:

It would be almost a miracle if the aggregate of decisions resulted in an actual growth rate equal to the “warranted” growth rate. There are likely to be some deviations all the time. But if they are of moderate dimensions, I would not suppose that they would bring the instability principle into operation. That is why I so much object to the knife-edge idea. It requires a fairly large deviation, such as might be caused by a revision of assessments across the board in some important industry, like the motor car industry, to produce a deviation sufficient to bring the instability principle into play. (Harrod, 1973, p. 33)

With this requirement for a greater push to set it off, Harrod is prepared to defend the instability principle and to maintain its importance. “I am confident that the theory that the warranted equilibrium growth rate of *laissez-faire* capitalism, without management or interference, is unstable, stands firm; and that it is the fundamental explanation of the business cycle” (ibid., p. 45). Harrod’s “confidence” in the instability principle is unsupported by the “empirical study” he thought necessary “to evaluate the amount of friction” in the economic system. His dynamic system, which is expressed solely in terms of rates of change, is not broad enough to provide a framework for such a study.

### ***Policy Implications***

The policy implications that Harrod draws from his dynamic analysis refer to concepts developed in that analysis, but they do not go much beyond what can be inferred from Keynes’ static analysis. (Harrod, of

course, makes reference to rates of change in income rather than to the level of income.) In order to ensure a potentially sustainable full employment growth path, it is necessary to bring the warranted rate of growth into equality with the natural rate of growth. The key variable for this purpose in Harrod's analysis is the desired saving ratio for the economy, which should take the value determined by equation (6). Harrod assumes that fiscal policy can, through its effects on the government's budget balance, secure the value for  $s_d$  that is appropriate for the natural rate of growth (see, for example, Harrod, 1964, p. 906). If, when this is done, entrepreneurs increase orders at the rate required in order to make the actual rate of growth equal to the natural rate, they will also find themselves on the warranted growth path. He recognizes that this increase might not be forthcoming because of "the fact that the majority of entrepreneurs are subject to great uncertainties, not only, or chiefly, in regard to the future growth path of the economy as a whole, but also in regard to the likely growth of their own industries and their chances of maintaining or increasing their shares of the markets within their industries" (ibid., p. 907). If there is a shortfall of orders, then as a result of the instability principle there is a consequent danger of recession. A further resort to fiscal policy in such a case, which increases the government's deficit and lowers the economy's saving rate — with the saving ratio initially having the appropriate value for the natural rate of growth — may prove to be too stimulative and result in "a demand-inflationary situation" (ibid., p. 909).

Monetary policy is given a possible role to play in stimulating investment in Harrod's analysis by affecting the "finance" available to firms that might be unable to increase investment under less stimulative circumstances "due to the imperfections of the capital market" (ibid., p. 912). Harrod did not believe that changes in interest rates had significant effects on  $C_r$ , except under special circumstances.<sup>18</sup> "I submit that the choice between alternative methods of differing capital intensity is governed almost exclusively by the availabilities of know-how and personnel; such choices may also sometimes be governed by the relativity of labour and material costs. Given the vast differences in these governing conditions, I submit that the differences in interest rates from place to place or from time to time are in fact of *negligible* importance in determining the capital intensity of methods of production" (ibid., p. 911, emphasis in original). Changes in  $C_r$  following a change in monetary policy might, however, occur as a result of consequent changes in the availability of finance. "It is fair to add that difficulties of borrowing in an imperfect capital market, as distinct from high interest rates as such, *may* depress  $C_r$ " (ibid., p. 913, emphasis in original).

Changes in fiscal and monetary policies cannot be relied on, according to Harrod, to be sufficient to ensure that the "correct" amount of investment for full employment growth is forthcoming, given the uncer-

tainties about future conditions. “In a growing economy entrepreneurs are required to cater for a demand which does not exist, and about which they can have no certainty that it ever will exist” (ibid., p. 914). Harrod suggests that “indicative planning” may be useful (ibid.). There was also the recognition, which we have seen was implicit in Keynes’ work, that full employment might be accompanied by strong inflationary wage pressures, and Harrod referred to the “need to secure a proper incomes policy” (ibid., p. 915).

## **Robinson’s Model of Accumulation**

### ***The Background and Setting***

Joan Robinson saw her work on the accumulation of capital “as the generalization of the *General Theory*, that is, an extension of Keynes’ short-period analysis to long-run development” (Robinson, 1956, p. vi). Such a generalization, in order to be deemed successful, must be consistent with Keynes’ analysis. Robinson emphasized repeatedly the importance of recognizing that Keynes’ General Theory is set in a moment of historical time, where the past has provided capital equipment, knowledge, skills, and attitudes, while the state of future conditions is uncertain and unknowable, and provisions for the future can be based only on guesswork and conventional responses. For example, she wrote “Keynes . . . brought the argument down from the cloudy realms of timeless equilibrium to here and now, with an irrevocable past, facing an uncertain future” (Robinson, 1971, p. 89). The importance of the “here and now,” that is, the short period, in her general approach to economic theory should not be overlooked. “Everything that happens in an economy happens in a short-period situation, and every decision that is taken is taken in a short-period situation, for an event occurs or a decision is taken at a particular time, and at any moment the physical stock of capital is what it is; but what happens has a long-period as well as a short-period aspect. . . . Short-period decisions affect the utilization of given equipment . . . long-period decisions affect the stock of productive capacity” (Robinson, 1956, p. 180). In order to deal with these long-period decisions, it is necessary to first examine the short-period situation. One of her criticisms of Harrod’s theory was that “The whole argument is conducted in terms of the rates of growth without any discussion of initial conditions” (Robinson, 1965, p. 55).

In spite of her criticisms of what she took to be critical features of Harrod’s dynamics, Robinson acknowledged its importance for her own work. “My first attempt at setting out an analysis of accumulation was inspired by Harrod, and I must repeat once more my gratitude for his most fruitful provocation” (Robinson, 1956, p. vi). She borrowed heavily from Kalecki’s (1971) presentation of the theory of effective demand, and incorpo-

rated it into her own approach. Although he was a contemporary, she placed him in the same category as Keynes, Wicksell and Marshall, “our progenitors [to whom reference is made] at particular points for the reader’s convenience, not by way of acknowledgement of their legacies” (ibid.).

Robinson felt the need, six years after the publication of *The Accumulation of Capital*, to write a lengthy essay — “A Model of Accumulation” (Robinson, 1962, pp. 22–87) — that could serve as an introduction to the earlier work. The following presentation draws heavily on this essay, since it makes clear both the importance of the short-period setting, with its Keynesian (and Kaleckian) flavour, and Robinson’s inability to develop a convincing equilibrium story within that context.

Robinson’s basic model for this study of growth assumes a closed economy with negligible government economic activity. The two social classes are workers and capitalists, with the latter being further divided into two groups, rentiers and entrepreneurs. Rentiers are those whose income is derived from the ownership of assets (equity and debts of firms) — there are no scarce natural resources in the model — and entrepreneurs are those who not only own such assets but who also (through firms) take an active role in the organization of production. Only part of profits is distributed in the form of interest and dividends, with the rest being retained by firms. All investment is in productive capital, and it is “entirely governed by decisions of firms” (Robinson, 1962, p. 36). It is further assumed, for purposes of simplicity, that workers do not save, but the critical assumption for Kalecki’s/Robinson’s theory of distribution is that the propensity to save out of profits is greater than the propensity to save out of wages. The action of firms in retaining some of their profits assures that this condition is satisfied.

### *The Short-Period Situation*

For Robinson one of the hallmarks of Keynesian models of accumulation is the projection “into the long period [of] the central thesis of the General Theory, that firms are free, within wide limits, to accumulate as they please, and that the rate of saving of the economy as a whole accommodates itself to the rate of investment that they decree” (ibid., pp. 82–83). She thus begins her analysis with a short-period situation in which the actual investment is equal to the investment planned by firms, and the level and distribution of income are such that desired saving is equal to this level of investment. Even though she recognizes the need for the passage of time before the multiplier effects of a change in investment are completed (ibid., p. 41), she concentrates, as did Keynes, on situations characterized by short-period equilibrium. When changes in investment are being considered, this procedure implies that the full multiplier effects of the changes work themselves out within the short period.

The national accounting identity between gross national product and gross national expenditure, in any short period, for the basic Robinson model can be written as:

$$W + P = I + C_c + C_w \quad (7)$$

where  $W$  represents total wages;  $P$ , gross profits;  $I$ , gross investment;  $C_c$ , rentiers' consumption; and  $C_w$ , worker's consumption. Equation (7) can be rewritten as:

$$P = I + C_c - (W - C_w) \quad (8)$$

Robinson assumes that there is a lag between the receipt of profits and rentiers' consumption expenditures, with dividends being a function of last period's profits and interest income depending on the terms at which finance has been raised in the past. Equation (8) can thus be turned into a causal explanation of profits, rather than just an equality that must hold by definition, with all the items on the right-hand side of equation (8) being determined independently of the value for current profits. In the situation of short-period equilibrium assumed by Robinson, both  $I$  and  $C_c$  would be predetermined, and with a zero propensity to save out of wages,<sup>19</sup> the third term on the right-hand side of the equation disappears. Rentiers' consumption can be represented by  $(1 - s_c)\beta P_{-1}$ , where  $s_c$  is the propensity to save of rentiers;  $\beta$  is the proportion of gross profits distributed in interest and dividends; and  $P_{-1}$  is gross profits in the preceding period. With this substitution for  $C_c$ , equation (8) is replaced in a situation of short-period equilibrium by:

$$P = I + (1 - s_c)\beta P_{-1} \quad (9)^{20}$$

Profits are thus determined in short-period equilibrium by capitalists' expenditures. These expenditures are exogenous in the short period, with workers' consumption expenditures being endogenous. Employment in the capital-goods sector and in the production of consumption goods for capitalists, depends on demand for these goods in real terms, and on the productivity of labour in their production. Total employment (and thus total economic activity) then depends on the real-wage rate since this determines, given the employment dependent on capitalists' expenditures, the induced employment in the production of consumption goods for workers.<sup>21</sup> Robinson implicitly assumes that employment in the capital-goods sector is pre-determined,<sup>22</sup> with firms being able to obtain the finance required for the carrying out of their investment program in real terms even in the face of some increase in prices, but she allows for the possibility of capitalists' consumption (those, for example, who are retired, or widows of workers, who live on relatively fixed money incomes, are included in the rentier class) being squeezed.

Robinson sketches out two possible states for competitive conditions.

In one, markets are oligopolistic with firms being able to maintain profit margins in the face of fluctuating demand, and thus real-wage rates tend to be unaffected by such changes, with the level of economic activity (employment) taking the full brunt of such fluctuations. In the other, the consumption-goods sector is assumed to be competitive in the short-period sense, with prices adjusting to the state of demand in order to keep plants operating at normal capacity rates. Changes in investment in the latter case affect employment only in the investment sector and real-wage rates, but not employment in the consumption sector. Robinson works out her theory of accumulation on the assumption of competitive conditions: “let us suppose that competition (in the short-period sense) is sufficiently keen to keep prices at the level at which normal capacity output can be sold” (ibid., p. 46), and thus employment in the consumption-goods sector is determined by available plant in that sector. Her treatment of the short period thus preserves one of the aspects of Keynes’ analysis — the inverse relation between real-wage rates and the level of employment — even though she, unlike Keynes, treats employment in the consumption-goods sector as being unresponsive to changes in effective demand.<sup>23</sup> In the oligopolistic version of her model it is possible for real-wage rates to be unchanged even though employment is higher, since increased investment leads to a higher rate of utilization of plant, with unit prime costs and prices being constant up to the point where plants are being operated at normal productive capacity.<sup>24</sup>

### *The Introduction of Long-Period Equilibrium*

Equation (9) represents one side of Kalecki’s double-sided relationship between investment and profits (Kalecki, 1971, pp. 1–8). It shows that the level of profits is positively related to the pre-determined volume of investment, while the other side has investment decisions in the period — decisions that will result in investment activity in future periods — being positively related to current profits. In spite of her critical attitude to economic theories that concentrate only on equilibrium positions, Robinson expresses this double-sided relationship only in equilibrium form, as a relationship between the rate of accumulation and the rate of profits. To put it into this form she must make use of the value of capital — a value that would be of economic significance only in a situation of long-period equilibrium. In such a case the long-term expectations that led to the existence of this short period’s capital equipment would have been justified by events, with the actual rate of return on investment being equal to the expected rate of return. In this equilibrium situation — and only in such a situation — the same total value would be obtained by calculating this equipment’s historical cost using this rate of return, or by using this rate to discount the expected stream of future quasi-rents.

Robinson tries to use the value of capital in the particular short-period situation represented by equation (9) by introducing the assumption that entrepreneurs expect future conditions will be like those in the present. Her analysis of accumulation in the long run is conducted “on the assumption that at every moment entrepreneurs expect the future rate of profit obtainable on investment to continue indefinitely at the level ruling at that moment; that they expect the rate of technical progress (which may be nil) to be steady and that they fix amortisation allowances for long-lived plant accordingly. When something occurs which causes a change, we assume that expectations are immediately adjusted, and that no further change is expected” (Robinson, 1956, p. 67). Therefore firms calculate the rate of return to be expected on investment — let it be denoted by  $r$  — on the basis of prices and wages ruling in the current short period. Under these assumptions, the net profits obtained from this period’s equipment can be expected to be earned in each subsequent short period, indefinitely. The present value of this equipment, its “capitalized” value, is thus equal to the ratio of the net profits to the expected rate of return on investment. Let this value be denoted by  $K$ . If, in equation (9), we subtract an amount  $D$ , representing the period’s depreciation, from both sides of the equation and divide them by  $K$ , we obtain:

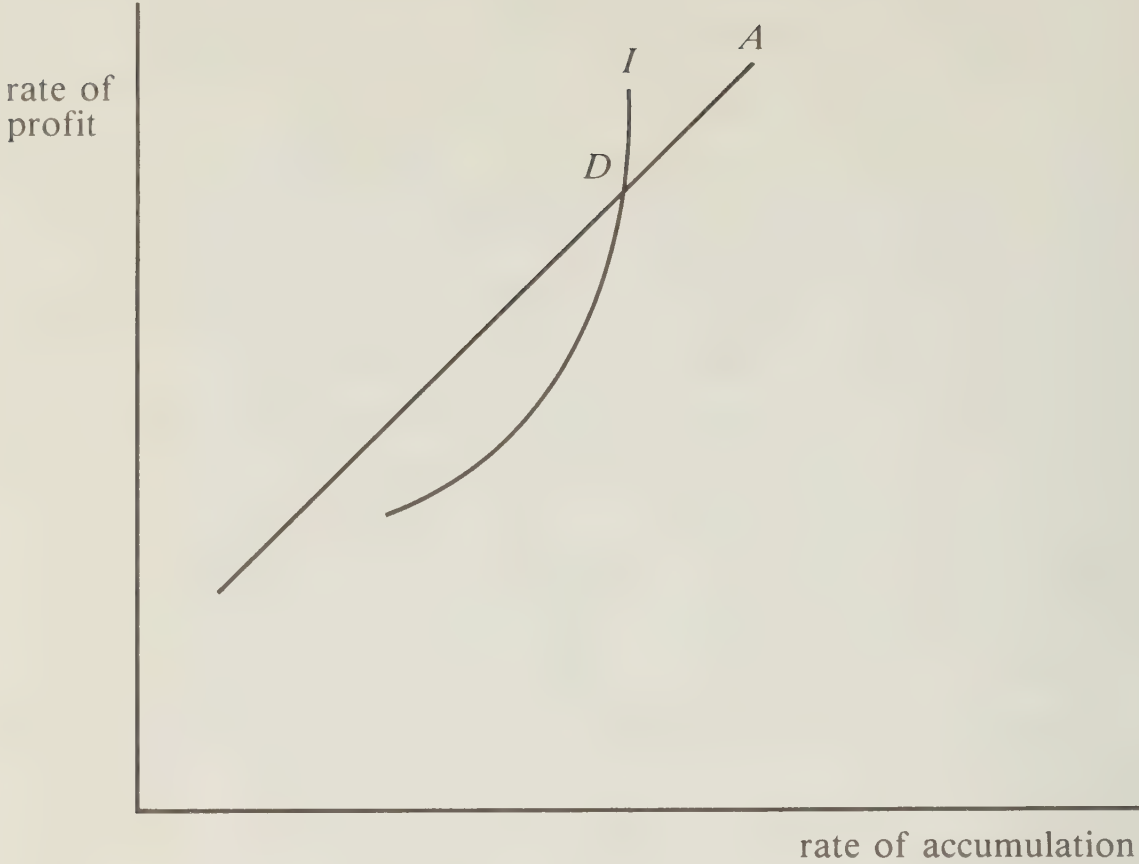
$$\begin{aligned} (P - D)/K &= (I - D)/K + (1 - s_c)\beta P_{-1}/K, \text{ or} \\ r &= g_k + (1 - s_c)\beta P_{-1}/K \end{aligned} \quad (10)$$

where  $g_k$  is the rate of accumulation in the period.<sup>25</sup> Equation (10) shows that the rate of profit in the period is a linear function of the period’s rate of accumulation. It is represented by the 45-degree line  $A$  in Figure 7-3.

This shows that any given percentage increase in the rate of accumulation would result in an equal percentage increase in the rate of profits.<sup>26</sup> The curve labelled  $I$  — where the independent variable is on the ordinate — represents the other side of the double-sided relationship between profits and accumulation. Robinson draws it to show that, at least for some range of values, there is a positive relationship between the expected rate of profit and the rate of accumulation. The placement of this curve, whether it lies more to the right, or to the left, depends on the conditions of finance in the economy — easier credit conditions resulting in a curve lying further to the right — and on the “animal spirits” of the entrepreneurs (see Keynes, 1936, pp. 161–63).

The further the  $I$ -curve is to the right, the higher the equilibrium rates of profit and accumulation as given by the point of intersection of the  $I$  and  $A$  curves at point  $D$ .<sup>27</sup> The value for this point would also be affected by the height of the line  $A$ , which depends on the “thriftiness” conditions. The greater the degree of thrift in the economy — the greater the rentiers’ propensity to save and/or the smaller the proportion of profits distributed — the lower is this line, and thus the smaller are the equi-

FIGURE 7-3



librium rates of profit and accumulation for a given *I*-curve. All such comparisons must be handled with care because of the complex interdependence of decisions made in an economy. For example, it might not be reasonable to assume, as is done above for purposes of exposition, that the positions of these curves are independent. For example, when the urge to accumulate is very strong, as would be indicated by an *I*-curve that lies to the right of the one drawn in Figure 7-3, then the corresponding *A*-line might also be lower as firms increase their retention ratio (that is, reduce  $\beta$ ) in order to help raise the finance needed for a higher rate of accumulation. The net effect of these two shifts might be such as to leave the rate of profits relatively unchanged even while they increase the rate of accumulation.<sup>28</sup>

*The “Desired” Rate of Accumulation*

In Figure 7-3 the only point that is consistent with Robinson’s general methodological position is the intersection point *D*. If the economy just happens to be in the position represented by this point, then entrepreneurial expectations are being fulfilled by events. The rate of accumulation at that point is generating the rate of profit — and the expectation of profit — that is required to cause it to be maintained. Robinson calls this

rate of accumulation the desired rate of accumulation, and notes its similarity to Harrod's warranted rate of growth (Robinson, 1962, p. 49). Both are equilibrium rates of growth for entrepreneurs, but they may be accompanied by involuntary unemployment. Robinson, however, also refers to other points in Figure 7-3 in discussing the "stability" of the equilibrium position at point *D*. This discussion, which is conducted in terms of the relative slopes of the *I* and *A* curves at their point of intersection, is based on the assumption — noted above — that in the face of a change, expectations are immediately adjusted to conform to the new situation and no further change is expected. Starting from any point that is not *D*, entrepreneurs would keep experiencing changes in the rates of profit calculated in the manner required for equation (10), but they are assumed to keep expecting no further changes at each stage in spite of their series of disappointments. Robinson warned against such simple-minded approaches to the question of stability in models that try to reflect historical time in the introductory section of "A Model of Accumulation." "A world in which expectations are liable to be falsified cannot be described by the simple equations of the equilibrium path. The out-of-equilibrium position is off the page, not in the same era of logical time as the movement along the path" (ibid., p. 25). Her model of accumulation — if it is to be true to the spirit of Keynes' General Theory — must allow for the possibility that expectations will be falsified, and thus it is by no means clear that the economy would ever end up, or even tend toward, an equilibrium position such as that at point *D*. The consequences of being in an equilibrium position can be examined in a Keynesian model, but there is no reason to expect, in general, a movement toward such a position.

The attitude taken here to long-period equilibrium is similar to the approach Robinson adopted in a 1959 *Economic Journal* article on "Accumulation and the Production Function" (reprinted in Robinson, 1960). She did not try to provide any plausibility to an equilibrium growth path. "But why try to make it seem plausible, when we know that in real life nothing like it ever happens? Let us take it simply as an exercise, and postulate that accumulation does take place in this way for no other reason than that is what we choose to postulate" (ibid., p. 134). It could be illuminating to examine the consequences of an equilibrium path being followed, or to compare the characteristics of different equilibrium paths, but the introduction of analytic devices that result in such paths being followed is not consistent with Keynes' historical time framework.

Our discussion of the determinants of the position of equilibrium in Figure 7-3 can be used to illustrate what Robinson calls "the central paradox of the General Theory projected into long-period analysis" (Robinson, 1962, p. 60). This illustration is concerned only with comparisons of different economies, each in its own equilibrium position with constant rates of profit and accumulation, and it can shed no light

on the effects of changes in the values of the parameters, or of how to move from one equilibrium position to the other. It is assumed that the availability of labour does not constrain growth in any of these cases, with the actual rate of growth being limited only by the desired rate. In comparing two economies with the same urge to accumulate and the same conditions of finance (that is, with the same *I*-curve), the one with the greater thriftiness will have a lower rate of accumulation. "When the actual rate of growth is limited only by the desired rate, therefore, greater thrift is associated with a lower rate of accumulation" (ibid.).

Robinson does recognize, however, that the relationship between accumulation and the degree of thriftiness is very complex (as noted above, it is arguable whether the *A* and *I*-curves can be treated independently of each other), and there are situations where greater thriftiness promotes accumulation. For example, when the urge to accumulate is high and there are growing pressures on real-wage rates that foreshadow the approach of the inflation barrier and its accompanying restraints on investment, then a higher degree of thriftiness would provide more room for accumulation to proceed unchecked. The economy with the greater thriftiness could thus have both a higher rate of accumulation and higher labour productivity after some period of time, since technical progress is chiefly introduced in Robinson's model through investment in plant and equipment.

There is here a similarity to our conclusions concerning Keynes' treatment of finance, investment and saving. In situations where unemployment and money-wage rates that are moving with labour productivity are to be found, a lower degree of thriftiness by increasing effective demand will promote a higher rate of accumulation. In such cases there is no obstacle to a higher rate of accumulation, and a higher rate will also increase saving. Investment with the provision of finance that makes an increase possible can be said to determine saving. In situations where money-wage rates and prices have been increasing and investment is prevented from increasing at a faster rate because of restraints imposed to limit inflationary pressures, a higher degree of thriftiness would provide room for a higher rate of accumulation. The investment that takes place cannot be explained without reference to the current propensity to save, and there is not a simple and general causal relation between investment and saving.

The curves in Figure 7-3 can also be used to provide another of the comparisons that Robinson makes. If two economies with the same degree of thriftiness (same *A*-line), but with different urges to accumulate (different *I*-curves), are compared, then the one with the greater urge to accumulate (the *I*-curve would lie further to the right) would have both a higher rate of accumulation and a higher rate of profit. If, at the time this comparison is made, both economies are utilizing roughly the same technique of production, then the economy with the higher rate of

accumulation would have the lower real-wage rate. Over time, however, the techniques of production will improve more rapidly in the economy with the higher rate of accumulation, and real-wage rates will catch up with, and surpass, those in the more slowly-growing economy. This type of comparison reflects the dynamic version of the dilemma Robinson saw “trade unions” facing in her 1937 essay on “Full Employment.” In that essay there was the short-period inverse relation between the level of employment and the real-wage rate. Higher investment would lead to higher employment, and if unions took advantage of increased demand for labour to try and bring about a sharp increase in money wages, then “a sufficient rise in money wages will always lead to a rise in the rate of interest and so check an increase in employment [through its effects on investment]” (Robinson, 1937, p. 27). In the dynamic version there is not only the matter of balancing the interests of the employed against those of the unemployed, but also the interests of the present generation of workers (as reflected in current real-wage rates) as against those of the future generations. Money-wage increases that indirectly inhibit investment adversely affect labour productivity and real-wage rates in the future.<sup>29</sup>

### *A Variety of Growth Possibilities*

Robinson’s placing of an equilibrium rate of growth — the desired rate of accumulation — at the centre of a Keynesian theory of accumulation, and the treatment of this equilibrium position as stable, represents a significant departure from the basic features of a Keynes-type analysis. This was recognized in various places in Robinson’s writings, but she never resolved the dilemma between the felt need to present a theory of accumulation that contains a story of development that is given some credibility, and the unpredictability of investment, which is the hallmark of Keynes’ analysis. Her discussion of features of possible growth paths goes some of the way toward meeting the former goal by describing growth situations, which may provide insights into conditions and choices in particular economies at particular times, while still leaving open the question of investment behaviour.

One of the possible growth situations is labelled the “*golden age* thus indicating that it represents a mythical state of affairs not likely to obtain in any actual economy” (Robinson, 1956, p. 99, emphasis in the original). The desired rate of accumulation is accompanied in this case by full employment. This corresponds, in Harrod’s terminology, to the equality between the actual, warranted and natural rates of growth. Real-wage rates are increasing at the rate of (Harrod-neutral) technical progress, and the rate of profit is constant. In Robinson’s model there is more scope for bringing about the equality between  $G_w$  and  $G_n$  than in Harrod’s model, because the former allows for a range of possible distribu-

tions of income (thus introducing a possible range of values for  $s_d$  and  $G_w$ ), and the rate of technical progress is not given independently of entrepreneurial energy (which may tend to move  $G_n$  toward a higher  $G_w$ ). There are other situations where a steady rate of growth is occurring, but in which there is unemployment and/or constraints on investment. The term a “limping golden age” is used to describe a situation where there is not enough plant to employ the whole labour force. The ratio of non-employed to employed may be increasing or decreasing over time. A “restrained golden age” is one where the desired rate of accumulation would result in a greater demand for labour than is available, and monetary restrictions act to limit the rate of accumulation. A “bastard golden age” is one where financial checks on investment are brought into play well before full employment is achieved, because of worker resistance to the lower real-wage rates that would accompany a higher rate of accumulation. There are also “platinum” ages, where the rate of accumulation is either accelerating (a “galloping platinum age”), or decelerating (a “creeping platinum age”).

Robinson also discusses the possible instability of the system when there are shocks, which move the economy away from point *D* in Figure 7-3. These shocks would lead to cyclical movements, without changing the underlying characteristics of steady growth, if expectations are based on a simple projection of current conditions. (The methodological inconsistency, referred to above, analyzing non-equilibrium situations with the aid of long-period equilibrium constructs, is not avoided here.) Robinson’s model does not incorporate Harrod’s instability principle, but it recognizes that there might be inherent instability in the system “when expectations are influenced by a projection, not just of today’s situation, but of the movement experienced in the recent past, so that a rise in the level of profits sets up an expectation of a further rise, and a fall, a further fall” (Robinson, 1962, p. 67). Under these conditions, firms would be “unable to settle down to a steady rate of accumulation” (*ibid.*). Robinson concludes, in spite of these possibilities, that “in a broad way, our analysis of long-run growth remains cogent. True, it cannot be discussed in terms of the desired rate of accumulation, for at each moment some different rate of growth is being planned. But the range of rates of growth (experienced over the course of fluctuations) tends to have a higher average when ‘animal spirits’ are high and thriftiness low” (*ibid.* p. 69).

Given the complex factors affecting both “thriftiness” and “animal spirits,” and the interrelations between these two, the above reference to their possible values can be no more than a beginning of the analysis of long-run growth.<sup>30</sup> This beginning does, however, point out some of the possible constraints on growth — especially those arising from the conflict over income shares — that must be resolved by institutional and

political arrangements if growth is to proceed at a satisfactory rate. Robinson's model, as well as Harrod's, also preserves an essential feature of Keynes' analysis that is often overlooked in theories of long-run growth. This feature is the possibility of there being insufficient effective demand to provide full employment in each of a sequence of short periods.

### ***Policy Implications***

In *The Accumulation of Capital*, after she had introduced the complexities of historical time in the chapters devoted to the short period, Robinson summed up, "We must be content with the conclusion that over the long run, the rate of accumulation is likely to be whatever it is likely to be" (Robinson, 1956, p. 244). This statement is a recognition of a basic feature of a Keynesian model. The equilibrium paths that such a model can outline are only illustrative of possible avenues of development. These models can show the potential conflicts inherent in certain situations, and what would happen if they were resolved, or allowed to continue, but the question of the extent to which they would be resolved is not one that the model can handle. A Keynesian model must be open-ended to allow for the historical, social and technological features of an economy, which affect the behaviour of individuals and groups in the economy, and its overall performance.

The policy needs made apparent by Keynes' analysis — continuing concern over the rate of investment, and the need to find ways of keeping the lid on inflationary pressures in situations where full employment is approached — are no less important when his analysis is extended to the long period. Investment is an important determinant of effective demand, but over time it also increases productivity and this latter feature can become important in a long-period analysis. The short-period opposition between investment and real-wage rates appears in Robinson's analysis when the rate of accumulation and real-wage rates in a given situation are considered, but the maintenance of high rates of accumulation over time could lead eventually to higher real-wage rates. There are potential trade-offs here for workers between present and future benefits, but economic theory cannot begin to deal with the institutional arrangements required to make the various groups confident that sufficient future benefit would accrue to them as a result of present sacrifices. Similarly, Robinson's analysis points out that at times a high propensity to save, by depressing effective demand will adversely affect current employment and future investment, while at others it will facilitate a higher rate of accumulation. Whether policy should act to promote saving or not depends on the particular circumstances of the economy being considered.

## Notes

This study was completed in November 1984.

1. Keynes' book, *The General Theory of Employment, Interest and Money*, will be referred to here as *The General Theory*, while the theory expounded in it will be referred to as the General Theory.
2. It is interesting to study the scaffolding of *The General Theory* as it appears in early drafts of the book (see, for example, Keynes, 1979, pp. 76–102) as Keynes was trying to work out the reasons for the difference between the conclusions of his theory and those of “classical” theory. He felt that the latter's implicit assumptions were equivalent to postulating a “real-wage” or “cooperative economy” in which the factors of production received predetermined shares of the aggregate output. Keynes contrasted this with what he called a “money-wage” or “entrepreneur economy” in which the entrepreneurs hire the factors for money, but where there is no “mechanism of some kind to ensure that the exchange value of the money incomes of the factors is always equal in the aggregate to the proportion of the current output which would have been the factor's share in a co-operative economy” (ibid, p. 78). In the former type of economy, labour will be employed up to the point where additional units will add to product an amount “which is sufficient to balance the disutility of the additional employment” (ibid). In the latter, entrepreneurs will hire labour up to the point where what an additional unit adds to their money costs is equal to what it is expected to add to their receipts. At such a point, the addition to product of an additional unit of labour might be more than sufficient to balance the disutility of the additional employment.
3. This is why Hicks in his reflective writings on Keynes' General Theory (and his own earlier interpretations of that theory) noted that “there is only a part of the Keynes theory which is *in time*” (Hicks, 1976, p. 140, emphasis in original). He had earlier commented on the difficulty of reconciling the time intervals implicit in Keynes' analysis:

It is one of the major difficulties of the Keynes theory (a difficulty that was acutely felt by its first readers, though it has not been lulled to sleep by long familiarity) that it works with a *period* which is taken to be one of equilibrium (investment being equal to saving, saving that is a function of *current* income), and which is nevertheless identified with the Marshallian short period, in which capital equipment (now the capital equipment of the whole economy) remains unchanged. The second seems to require that the period should not be too long, but the first requires that it should not be too short; for the *process* of getting into the equilibrium in question (the multiplier process) must occupy a length of time that is by no means negligible. It is not easy to see that there can be any length of time that will adequately satisfy both of these requirements. (Hicks, 1965, pp. 64–66, emphasis in the original)

4. For the various ways in which an aggregate supply function can be derived conceptually from industry supply curves, see Asimakopulos (1982).
5. In this 1936 review of *The General Theory*, Robertson noted that Keynes gave two different definitions of the aggregate demand function. “Mr. Keynes . . . oscillates between using ‘aggregate demand price’ to mean what he has defined it to mean, viz what entrepreneurs *do* expect to receive, and using it to mean what they ‘can expect’ to receive, i.e., what they can legitimately expect to receive, because that, whether they expect it or not, is what they *will* receive. In a world in which errors of anticipation are common, the distinction is not unimportant” (Robertson, 1936, p. 169, emphasis in the original). Parrinello (1980), Casarosa (1981) and Asimakopulos (1982), argued that Keynes' first definition of the aggregate demand function, where he had it show “the proceeds which entrepreneurs expect to receive” (Keynes, 1936, p. 25) from the employment they offer, is inconsistent with the microfoundations of his theory. A restatement of Keynes' definition to eliminate this inconsistency does not affect the conclusions of his theory.
6. Asimakopulos (1982, pp. 20–21) argued that given the nature of Keynes' aggregate supply function, effective demand in general, and not simply this demand when the economy is in short-period equilibrium, is “the point on the aggregate supply function corresponding to the expectations of proceeds held by entrepreneurs.”

7. It was recognized by Keynes (1936, p. 301) and his followers, as we shall see below, that money-wage rates tend to rise with the level of employment, but this recognition is not inconsistent with the way he used aggregate demand and supply curves based on constant money-wage rates. They serve to illustrate the short-period equilibrium level of employment and to characterize the stability of that equilibrium, given money-wage rates. A different type of analysis that dealt with changing levels of employment would have to recognize the changing money-wage rates that would follow changes in employment, and the aggregate demand and supply curves would be continually shifting.
8. This relation is proved in Asimakopulos (1982, pp. 34–35).
9. Patinkin, in considering possible anticipations of Keynes' General Theory, focussed on the "central message" of an author's writings, on "that which was fully integrated into his conceptual framework and that which was not; between, if you wish, the 'signal' — or what I have called the 'central message' — the writer wished to convey and the 'noise'" (Patinkin, 1982, p. 16). Patinkin took the "central message" of Keynes' General Theory to be the first part of the "central message" given above. For a defence of the position taken here see Asimakopulos (1983a).
10. They were entitled "Alternative Theories of the Rate of Interest," and "The 'Ex Ante' Theory of the Rate of Interest," and appeared in the June and December issues, respectively.
11. It was assumed that there was a one "week" time lag in the response of consumption to changes in income. This can be represented by the function  $C_t = c Y_{t-1}$ , where  $c$  is the marginal propensity to consume. If, beginning from a position where income has been constant, so that  $Y_0 = Y_1$ , investment is increased by  $\Delta I$  in week 1 and is maintained at its new level, then the finance for the initial  $\Delta I$  must come from banks and be passed through speculators. In the succeeding week consumption would have increased by  $c\Delta I$  and desired saving by  $(1 - c)\Delta I$ , and speculators need provide financing for only  $c\Delta I$  of the maintained increase in investment. (Recall Kaldor's assumption "that all increase in 'genuine savings' is directed at the purchase of long-term assets" (Kaldor, 1960, p. 49 n. 9.) Consumption in week 3 would be higher by  $c(1 + c)\Delta I$  and desired saving by  $(1 - c^2)\Delta I$ . Speculators thus need provide financing for only  $c^2\Delta I$ . It can be deduced that in order to sustain an increase in investment of  $\Delta I$  indefinitely, the speculative commitment (and the maintained increase in short-term credit provided by the banks for the "finance" motive, with additional credit being required for the "transactions" motive) would be equal to  $\Delta I(1 + c + c^2 + \dots)$ , or  $\Delta I/(1 - c)$ . This commitment is inversely related to the propensity to save.
12. See the quotations from some of Keynes' letters in Kahn (1974).
13. The pressure for increasing money-wage rates as employment increases appears particularly acute in Keynes' model because of its assumption of an inverse relation between the real-wage rate and the volume of employment. Dunlop (1938) and Tarshis (1939) examined the relative movements of employment and real-wage rates, and did not find the predicted relation. This relation is not a critical one for Keynes' theory, and all its essentials can be retained without it. A recent study by Geary and Kennan (1982) reviews the many empirical investigations of the employment-real wage relationship — and adds one of its own — and concludes that it is not possible to reject the hypothesis that movements in employment and real wages are independent.
14. There were some changes in Harrod's notations over the years. In the present study, his 1973 notation will be used.
15. In his 1939 essay Harrod left open the question of whether the level of income in this equation ( $Y$ ) should refer to income in the earlier or later of the two periods used to calculate the change in income, although income for the earlier period appeared in his equation. As a result of Alexander's (1950) comment, he realized that it should be income in the later period if the term on the right-hand side of the equation is to be the fraction of income saved (Harrod, 1951, pp. 268–69).
16. Davidson reports that in "a conversation (31 January 1969) Harrod indicated that the warranted rate of growth occurs when entrepreneurs correctly foresee the point of effective demand each period *and* the supply price includes a normal return on standard volume" (Davidson, 1978, p. 45n, emphasis in the original).

17. Solow mistakenly saw instability in Harrod's model as being due to "the crucial assumption that production takes place under conditions of *fixed proportions*" (Solow, 1956, p. 65, emphasis in the original).
18. Neoclassical theorists, such as Solow (1956), assumed that the required capital coefficient was sensitive to changes in the rate of interest.
19. This assumption is, as noted above, not critical. "For many of the problems with which we shall be concerned it lightens the argument very much, without making any essential difference to it, if we assume that there is no net saving, on balance, from earned income" (Robinson, 1962, p. 39).
20. If rentiers' consumption is a function of current profits, and given by the equation  $C_c = (1 - s_c) \beta P$ , then the causal explanation for profits in short-period equilibrium refers only to investment and the propensity to consume out of profits. Instead of equation (9) we would have  $P = I/[1 - (1 - s_c)\beta]$ .
21. Equations for the determination of total employment in this type of model are to be found in Asimakopulos (1975, 326–27).
22. An exception to this is "when there is a sharp rise in the demand for money such as occurs in inflationary conditions, they [the banks] raise the rate of interest to a level which checks investment" (Robinson, 1962, pp. 43–44). With investment no longer being predetermined — with firms not able "to accumulate as they please" — the model is no longer operative. She sees this "inflation barrier" (Robinson, 1956, p. 48) as usually arising as a result of irresistible pressures for higher money wages when investment is increasing. "But a rise in money-wage rates increases money expenditure, so that the vicious spiral of money wages chasing prices sets in. There is then a head-on conflict between the desire of entrepreneurs to invest and the refusal of the system to accept the level of real wages which the investment entails; something must give way. Either the system explodes in a hyper-inflation, or some check operates to curtail investment" (ibid.).
23. Robinson assumes that plant marginal cost curves have a reverse-L shape, with fairly well-defined normal productive capacity rates.
24. In this case, it is the wage share, rather than the real-wage rate, that may be inversely related to the level of employment (Asimakopulos, 1975, p. 327).
25. It might be worth emphasizing again the big step involved in moving from equation (9) to equation (10). The former holds for any short period characterized by short-period equilibrium, while the latter also requires that there be a situation of long-period equilibrium in that short period. Robinson has often emphasized the very special nature of long-period equilibrium. For example: "Long-period equilibrium is not at some date in the future; it is an imaginary state of affairs in which there are no incompatibilities in the existing situation, here and now" (Robinson, 1965, p. 101).
26. Robinson's drawing of line *A* is such that when extended, it passes through the origin. This would only be the case if — contrary to Robinson's assumption — capitalists' consumption expenditures were a function of current profits.
27. Robinson also shows a second point of intersection to the left of point *D*, but it is not germane to our discussion and is not shown here.
28. The double-sided relationship between profits and investment can be expressed without reference to the value of capital and to the rate of profit. It would show, on the one hand, current profits as an increasing function of the level of current investment, and on the other, current investment decisions as an increasing function of the current level of profits (through its effects on the expectation of the profitability of investment). This formulation avoids the problem of obtaining a meaningful value for capital in a Keynesian model. The curves would be redrawn in each short period, with the rates of growth in output being calculated by working out and comparing the value for output in adjacent periods.
29. Malinvaud (1982) has a similar conflict between short-term and long-term goals of labour, but in his case it can come about as a result of the form investment takes when current wage rates are high, as well as to inadequate investment because of low profitability. High wage rates lead to the adoption of capital-intensive techniques and thus result in lower employment in the future. In what he considers "to be the most

likely case, a reduction of the wage rate will in the long run be unfavourable [since it decreases effective demand]. This is a case in which long term objectives obviously conflict with short term ones" (ibid., p. 9).

30. In the conclusion to the Appendix of "A Model of Accumulation," where Robinson briefly compares different models of accumulation (including her own), she notes their a priori nature, and the essential features of Keynesian models. "These models are all too much simplified and too highly integrated for it to be possible to confront them with evidence from reality. At this stage they must be judged on the a priori plausibility of their assumptions. There is an important difference in emphasis between them accordingly as they exhibit some kind of inbuilt propensity to maintain full employment over the long run or as they follow Keynes in regarding it as dependent upon enterprise that cannot be relied upon, unassisted, either to achieve stability in the short run or to maintain an adequate rate of growth in the long run" (Robinson, 1962, p. 87).

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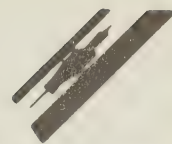
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